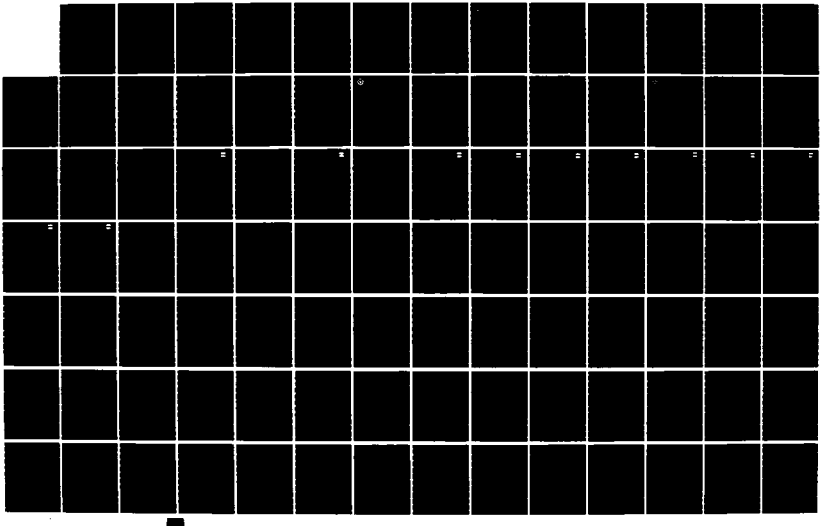
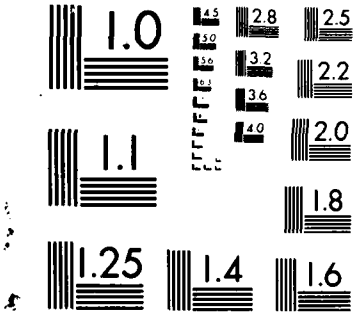
AD-A173 981 RDF (REFUSE-DERIVED FUEL) CO-FIRING COST/BENEFIT ANALYSIS USING THE NCEL R..(U) SYSTECH CORP XENIA OH H BELENCAN ET AL. AUG 86 NCEL-CR-86.012-VOL-2 1/3

UNCLASSIFIED N00123-83-D-0149 F/G 21/4 NL





CR 86.012
August 1986

NCEL
Contract Report

An Investigation Conducted
By SYSTECH Corporation
Sponsored By Naval Facilities
Engineering Command

FINAL REPORT: RDF CO-FIRING COST/BENEFIT ANALYSIS USING THE NCEL RDF COST MODEL VOLUME II, APPENDIXES

ABSTRACT The object of this effort was to determine the cost effectiveness of co-firing RDF in existing Navy boilers. The cost-benefit analysis was performed using the NCEL RDF Cost Model and site specific boiler and cost data acquired from four naval activities that were determined to have the highest probability of successful co-firing. The cost effectiveness was measured by the savings to investment ratio (SIR) and computed over a range of cost and operating conditions to determine optimum RDF co-firing scenarios for each facility. Based on present laid-down coal costs and solid waste disposal charges, no set of operating conditions could be identified wherein the use of either co-fired RDF-3 or RDF-5 could be economically justified. Volume I presents the report; Volume II contains appendixes, and Volume III is the terminal manual of RDF cost model.

NAVAL CIVIL ENGINEERING LABORATORY PORT HUENEME, CALIFORNIA 93043

METRIC CONVERSION FACTORS

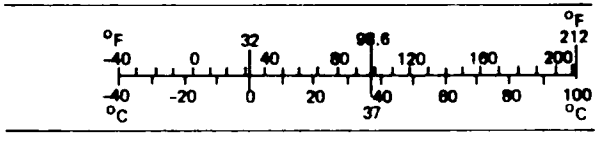
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2,000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1,000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1 REPORT NUMBER CR 86.012	2 GOVT ACCESSION NO.	3 RECIPIENT'S CATALOG NUMBER
4 TITLE (and Subtitle) Final Report: RDF Co-Firing Cost/Benefit Analysis Using the NCEL RDF Cost Model - Volume II, Appendixes		5 TYPE OF REPORT & PERIOD COVERED Final Sep 1985 - Aug 1986 6 PERFORMING ORG REPORT NUMBER
7 AUTHOR(s) Helen Belencan Gary Smith		8 CONTRACT OR GRANT NUMBER(s) N00123-83-D-0149
9 PERFORMING ORGANIZATION NAME AND ADDRESS SYSTECH Corporation 245 North Valley Road Xenia, OH 45385		10 PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS WU R0371-013-431C
11 CONTROLLING OFFICE NAME AND ADDRESS Naval Civil Engineering Laboratory Port Hueneme, CA 93043-5003		12 REPORT DATE August 1986 13 NUMBER OF PAGES 244
14 MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Naval Facilities Engineering Command 200 Stovall Street Alexandria, VA 22332-2300		15 SECURITY CLASS (of this report) Unclassified 15a DECLASSIFICATION DOWNGRADING SCHEDULE

16 DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution is unlimited.

17 DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18 SUPPLEMENTARY NOTES

19 KEY WORDS (Continue on reverse side if necessary and identify by block number)
refuse derived fuel, RDF, co-fired waste fuels, refuse fired boilers, cost/benefit analysis, RDF Cost Model

20 ABSTRACT (Continue on reverse side if necessary and identify by block number)
The object of this effort was to determine the cost effectiveness of co-firing RDF in existing Navy boilers. The cost-benefit analysis was performed using the NCEL RDF Cost Model and site specific boiler and cost data acquired from four naval activities that were determined to have the highest probability of successful co-firing. The cost effectiveness was measured by the

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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VOLUME II

TABLE OF CONTENTS

Appendices

APPENDIX A

FACILITY INPUT DATA QUESTIONNAIRES

DEPARTMENT OF THE NAVY
NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CA 93043

IN REPLY REFER TO
3900
Ser L71/RMR RDF
24 October 1985

From: Commanding Officer, Naval Civil Engineering Laboratory, Port Hueneme, CA 93043

To: Commanding Officer, Naval Amphibious Base Little Creek, PWD (Code N46), Norfolk, VA

Subj: INPUT DATA REQUIRED FOR COST/BENEFIT MODELLING OF RDF FUELS FOR COFIRING WITH COAL IN STOKER FURNACES

Ref: (a) NAVFAC Energy Project Work Unit Z0371-01-421D/E
(b) Phonecon from NCEL R.M. Roberts to your office 24 OCT 85

Encl: (1) RDF/Coal Cofired Boiler Model Input Data Questionnaire

1. Enclosure (1) is transmitted for your completion. It is requested that the subject data be provided for use in reference (a) as explained by reference (b).

2. It is expected that there may be some difficulty with some of the model input information requested. Determination of the limits of information availability is an important consideration in the configuring of the RDF/Coal Cofired Boiler Model. We will therefore be as interested in examining what data you can supply us with as we will be in finding out what data you cannot. To ensure that our questions are clear and properly structured, we urge you to solicit as often as necessary the assistance of the contractor who is responsible for the final design of the model. He may be reached as follows:

Mr. Gary E. Smith
Systech Corporation
245 No. Valley Rd.
Xenia, OH 45385
(513) 372-8077 or (513) 429-2533

3. When you have completed the questionnaire, please mail it to the contractor. If there are any administrative issues that need attention, please contact me on A/V 360-4193, FTS 799-4193, or comm'l (805) 982-4193. We will appreciate having your questionnaire by 15 November 1985.

Richard M. Roberts
Chemical Engineer
Code L71

ENCLOSURE (1)

NAVAL BASE: Naval Amphibious Base Little Creek

BLD #: 757

BOILER #: 107

PRIMARY CONTACT PERSON: Mr. Robert S Acra, Jr.

TITLE: Boiler Plant Operator Foreman

PHONE #: 804-464-8675

DESIGN FUEL INFORMATION

DESIGN TOTAL FUEL VALUE TO BOILER AT MCR (MAXIMUM CONTINUOUS RATING) (BTU/HR)	112 MBTU/HR
DESIGN FUEL TYPE	Bituminous Coal
HIGHER HEATING VALUE OF DESIGN FUEL (BTU/LB)	13400 TYP 12500 MIN. AVG
FRACTIONAL ASH CONTENT OF DESIGN FUEL, AS-RECIEVED	9.0%
FRACTIONAL MOISTURE CONTENT OF DESIGN FUEL	5.0%
HYDROGEN MASS FRACTION OF AS-RECIEVED DESIGN FUEL	36.0%
SPECIFIC HEAT OF DESIGN FUEL	12,500 BTU per lb.
DESIGN CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	~3% TYP (NOT DESIGN)
DESIGN RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	~4%
DESIGN TEMPERATURE OF DESIGN FUEL AT BOILER BOUNDARY (DEG F)	Ambient
DESIGN EXCESS AIR REQUIRED FOR DESIGN FUEL AT MCR (%)	25%

CURRENT FUEL INFORMATION

CURRENT FUEL TYPE	B. tuminous Coal
CURRENT FUEL VALUE TO BOILER AT MCR (BTU/HR)	
(FOR THE FOLLOWING, SUPPLY FUEL ANALYSIS REPORT IF AVAILABLE)	
HIGHER HEATING VALUE OF CURRENT FUEL (BTU/LB)	14,319 BTU per lb
FRACTIONAL ASH CONTENT OF CURRENT FUEL, AS-RECIEVED	7.53%
FRACTIONAL MOISTURE CONTENT OF CURRENT FUEL	4.65%
HYDROGEN MASS FRACTION OF AS-RECD CURRENT FUEL	32.04%
SULFUR MASS FRACTION OF AS-RECD CURRENT FUEL	0.5% TYP 1.5% SPEC
SPECIFIC HEAT OF CURRENT FUEL	13,653 BTU per lb
CURRENT CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	~2%
CURRENT RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	~4%
TEMPERATURE OF CURRENT FUEL AT BOILER BOUNDARY (DEG F)	Ambient
EXCESS AIR REQUIRED FOR CURRENT FUEL AT MCR (%)	~25%
MAXIMUM BOILER TURNDOWN ACHIEVABLE WITH CURRENT FUEL (%)	90 → 40 KLB/HR
EXCESS AIR REQUIRED FOR CURRENT FUEL AT NEAR MAXIMUM TURNDOWN (%)	~25%

BOILER AND EQUIPMENT INFORMATION

FOR THE FOLLOWING, GIVE THE MANUFACTURER, EQUIPMENT DESCRIPTION AND RATED CAPACITIES OR THROUGHPUTS

FUEL FEED SYSTEM	DETROIT ROTOGRATE STOKERS, Type RG-3, 3 ea. 27" Rotors on ea. Boil
GRATE SYSTEM	DETROIT ROTOGRATE
ASH HANDLING SYSTEM	NATIONAL Conveyors B. - Vacuum System with Storage Silo
MULTICLONES OR CYCLONES	NONE
SCRUBBERS	NONE
ESP	NONE
BAGHOUSE	GRIFFIN ENVIRONMENTAL B. Inc. - RA-90 Reverse Air Cluster (18 Modules on 3 Boilers)

IS THE BOILER EQUIPPED WITH :

AN ID FAN — Yes

SOOTBLOWERS FOR THE CONVECTIVE — Yes

AN ECONOMIZER — Yes

SOOTBLOWERS FOR THE ECONOMIZER — Yes

WHAT TYPE OF ECONOMIZER TUBES? — Extended Gill Ring

OPERATIONS INFORMATION

AVAILABILITY OF EXISTING BOILER FIRED WITH CURRENT FUEL (%) — ~90%

DOES ADEQUATE BACKUP CAPABILITY EXIST — YES - 2 BOILERS MAX REQ'D + 1 STANDBY

DOES BOILER HAVE A HISTORY OF SLAGGING — No

FOR THE FOLLOWING, SUPPLY TEST REPORTS ON PARTICULATE EMISSIONS COMPLIANCE OR BOILER EFFICIENCY TESTS IF AVAILABLE

APPLICABLE PARTICULATE EMISSIONS STANDARD — .23 lb/MBtu

ACTUAL PARTICULATE EMISSIONS — 13.91 lbs/hr or K/3694 lbs/MB
.13694 lbs/MB

STACK TEMPERATURE (DEG F) — 450 °F

STACK VOLUMETRIC FLOW RATE (ACFM) — 42893 ACFM

AIR TEMP AT FD OR AIR-HEATING INLET (DEG F) — 80-100°F

PREHEAT COMBUSTION AIR TEMP (DEG F) — 370°F

FUEL TEMP AT BOILER BOUNDRY (DEG F) — ~60°F

BOTTOM ASH TEMP AT BOILER BOUNDARY (DEG F) —

FLY ASH TEMP AT BOILER BOUNDARY (DEG F) — ?

ECONOMIC INFORMATION

BASIC UNBURDENED OPERATOR WAGERATE ($/HR) _____

BURDENING ON BASIC WAGE RATE, A MULTIPLIER _____

COST OF CONVENTIONAL FUEL ($/TON) 38 + 21 shipping

COST OF ELECTRICITY ($/KWH) 0.021

DISPOSAL COST FOR ASH ($/TON) 25¢/% ASH - TON $25

STEAM DEMAND BY SHIFT BY SEASON BY DAY, AVERAGE HOURLY (BTU/HR)

SUMMER	SHIFT 1	SHIFT 2	SHIFT 3
MON-FRI			
SAT			
SUN			
WINTER			
MON-FRI			
SAT			
SUN			
SPRING AND FALL			
MON-FRI			
SAT			
SUN			

40,000 MBTU/hr

120,000

DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE ($/TON) _____

PROJECTED FUTURE DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE _____

PROJECTED LIFE OF LOCAL LANDFILL(S) _____

ANNUAL GENERATION RATE OF BASE WASTES (TON/YR) _____

NAME AND PHONE NUMBER OF CONTACT PERSON IN CHARGE OF:

NAVAL WASTE DISPOSAL ACTIVITIES NAME _____ PHONE # _____

LOCAL COMMUNITY OR COUNTY SOLID WASTE AUTHORITY NAME _____ PHONE # _____

ROUTINE REPLY, ENDORSEMENT, TRANSMITTAL OR INFORMATION SHEET

OPNAV 5216/158 (Rev. 7-78) *A WINDOW ENVELOPE MAY BE USED*
SN 0107-LF-052-1691 *Formerly NAVEXOS 3789*

CLASSIFICATION (*UNCLASSIFIED when detached from enclosures, unless otherwise indicated*)

FROM (*Show telephone number in addition to address*)
Commander, Puget Sound Naval Shipyard
Bremerton, Washington 98314

DATE
10 Dec 1985

SUBJECT
MCON P-500, Steam Plant

SERIAL OR FILE NO.
440.9:CKD:ca

TO
Systech Corporation
245 No. Valley Rd.
Xenia, OH 45385

ATTN: Mr. Gary E. Smith

REFERENCE

ENCLOSURE
RDF/Coal Cofired
Boiler Model Input
Data Questionaire

VIA

ENDORSEMENT ON

XX FORWARDED | RETURNED | FOLLOW UP, OR TRACER | REQUEST | SUBMIT | CERTIFY | MAIL | FILE

GENERAL ADMINISTRATION	CONTRACT ADMINISTRATION	PERSONNEL
FOR APPROPRIATE ACTION	NAME & LOCATION OF SUPPLIER OF SUBJECT ITEMS	REPORTED TO THIS COMMAND
UNDER YOUR COGNIZANCE	SUBCONTRACT NO. OF SUBJECT ITEM	
INFORMATION	APPROPRIATION SYMBOL, SUBHEAD AND CHARGEABLE ACTIVITY	DETACHED FROM THIS COMMAND
APPROVAL RECOMMENDED [ ] YES [ ] NO	SHIPPING AT GOVERNMENT EXPENSE [ ] YES [ ] NO	
[ ] APPROVED [ ] DISAPPROVED	A CERTIFICATE, VICE BILL OF LADING	OTHER
COMMENT AND/OR CONCURRENCE	COPIES OF CHANGE ORDERS, AMENDMENT OR MODIFICATION	
CONCUR	CHANGE NOTICE TO SUPPLIER	
LOANED, RETURN BY	STATUS OF MATERIAL ON PURCHASE DOCUMENT	
SIGN RECEIPT & RETURN		
REPLY TO THE ABOVE BY		
REFERENCE NOT RECEIVED		
SUBJECT DOCUMENT FORWARDED TO		
SUBJECT DOCUMENT RETURNED FOR		
SUBJECT DOCUMENT HAS BEEN REQUESTED AND WILL BE FORWARDED WHEN RECEIVED		
COPY OF THIS CORRESPONDENCE WITH YOUR REPLY		
ENCLOSURE NOT RECEIVED		
X ENCLOSURE FORWARDED AS REQUESTED		
ENCLOSURE RETURNED FOR CORRECTION AS INDICATED		
CORRECTED ENCLOSURE AS REQUESTED		
REMOVE FROM DISTRIBUTION LIST		
REDUCE DISTRIBUTION AMOUNT TO		

REMARKS (*Continue on reverse*)

SIGNATURE & TITLE
W. MAUPIN
by direction

COPY TO
NAVSHIPYD PUGET Codes: 440.9, 402.23

CLASSIFICATION (*UNCLASSIFIED when detached from enclosures, unless otherwise indicated*)

* G.P.O. 1982-587-016/5220

A-1

DEPARTMENT OF THE NAVY
NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CA 93043

IN REPLY REFER TO
3900
Ser L71/RMR RDF
24 October 1985

From: Commanding Officer, Naval Civil Engineering Laboratory, Port Hueneme, CA 93043

To: Commanding Officer, Puget Sound Naval Shipyard, PWD (Code 53.1), Bremerton, WA

Subj: INPUT DATA REQUIRED FOR COST/BENEFIT MODELLING OF RDF FUELS FOR COFIRING WITH COAL IN STOKER FURNACES

Ref: (a) NAVFAC Energy Project Work Unit Z0371-01-421D/E
(b) Phonecon from NCEL R.M. Roberts to your office 24 OCT 85

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Mr. Gary E. Smith
Systech Corporation
245 No. Valley Rd.
Xenia, OH 45385
(513) 372-8077 or (513) 429-2533

3. When you have completed the questionnaire, please mail it to the contractor. If there are any administrative issues that need attention, please contact me on A/V 360-4193, FTS 799-4193, or comm'l (805) 982-4193. We will appreciate having your questionnaire by 15 November 1985.

Richard M. Roberts
Chemical Engineer
Code L71

ENCLOSURE (1)

NAVAL BASE	PUGET SOUND NAVAL SHIPYARD
BLD #	900
BOILER #	No 1, 2, 3
PRIMARY CONTACT PERSON	CURT DUEVER
TITLE	Project Engineer
PHONE #	206-476-3879

DESIGN FUEL INFORMATION

DESIGN TOTAL FUEL VALUE TO BOILER AT MCR (MAXIMUM CONTINUOUS RATING) (BTU/HR)	172.84×10^6 BTU/HR (Per Boiler) (Per Boiler)
DESIGN FUEL TYPE	Coal or Grade #2 o/l
HIGHER HEATING VALUE OF DESIGN FUEL (BTU/LB)	10290 BTU/LB
FRACTIONAL ASH CONTENT OF DESIGN FUEL, AS-RECIEVED	9.13 %
FRACTIONAL MOISTURE CONTENT OF DESIGN FUEL	15.48 %
HYDROGEN MASS FRACTION OF AS-RECIEVED DESIGN FUEL	4.05 %
SPECIFIC HEAT OF DESIGN FUEL	10290 BTU/LB
DESIGN CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	4.05 %
DESIGN RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	.41 %
DESIGN TEMPERATURE OF DESIGN FUEL AT BOILER BOUNDARY (DEG F)	80°f
DESIGN EXCESS AIR REQUIRED FOR DESIGN FUEL AT MCR (%)	30 %

NOTE: This steam plant currently under construction will go on line OCT 1988

CURRENT FUEL INFORMATION

CURRENT FUEL TYPE	
CURRENT FUEL VALUE TO BOILER AT MCR (BTU/HR)	172.89 X 10⁶ BTU/HR
(FOR THE FOLLOWING, SUPPLY FUEL ANALYSIS REPORT IF AVAILABLE)	—
HIGHER HEATING VALUE OF CURRENT FUEL (BTU/LB)	9200 - 12200 BTU/Lb range
FRACTIONAL ASH CONTENT OF CURRENT FUEL, AS-RECIEVED	3 - 11% range
FRACTIONAL MOISTURE CONTENT OF CURRENT FUEL	5 - 23% range
HYDROGEN MASS FRACTION OF AS-RECD CURRENT FUEL	3.8 - 5.2% range
SULFUR MASS FRACTION OF AS-RECD CURRENT FUEL	* 0.30 - 1.67% range
SPECIFIC HEAT OF CURRENT FUEL	9200 - 12200 BTU/Lb range
CURRENT CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	4.05%
CURRENT RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	.41%
TEMPERATURE OF CURRENT FUEL AT BOILER BOUNDARY (DEG F)	30° - 100° F range
EXCESS AIR REQUIRED FOR CURRENT FUEL AT MCR (%)	25 - 50% range
MAXIMUM BOILER TURNDOWN ACHIEVABLE WITH CURRENT FUEL (%)	Coal 42% - Coal/oil 18%
EXCESS AIR REQUIRED FOR CURRENT FUEL AT NEAR MAXIMUM TURNDOWN (%)	50% coal 10% oil

BOILER AND EQUIPMENT INFORMATION

FOR THE FOLLOWING, GIVE THE MANUFACTURER, EQUIPMENT DESCRIPTION AND RATED CAPACITIES OR THROUGHPUTS

FUEL FEED SYSTEM	Four Riley vari-Flex 15" Feeders 5100 Lb/Hr
GRATE SYSTEM	Riley Traveling grate spreader stoker 16' wide x 19' long 20,400 Lb/hr
ASH HANDLING SYSTEM	Hydro-Ash vacuum Pneumatic 15 Ton/hr
MULTICLONES OR CYCLONES	N/A
SCRUBBERS	Anhydro Dry scrubber 85% sulfer dioxide removal 173,888 Lb/hr
ESP	N/A
BAGHOUSE	GEESI, Reverse Air 190,317 Lb/hr

* Limited to 1% by Permit

IS THE BOILER EQUIPPED WITH :

AN ID FAN — Yes 80,000 ACFM

SOOTBLOWERS FOR THE CONVECTIVE — Yes 2ea G9B Diamond Rotary

AN ECONOMIZER — Yes

SOOTBLOWERS FOR THE ECONOMIZER — Yes 3ea G9B Diamond Rotary

WHAT TYPE OF ECONOMIZER TUBES? — Bare Steel Tube - RICEY

OPERATIONS INFORMATION

AVAILABILITY OF EXISTING BOILER FIRED WITH CURRENT FUEL (%) — N/A

DOES ADEQUATE BACKUP CAPABILITY EXIST — Yes 1ea Reserve UNIT

DOES BOILER HAVE A HISTURY OF SLAGGING — N/A

FOR THE FOLLOWING, SUPPLY TEST REPORTS ON PARTICULATE EMISSIONS COMPLIANCE OR BOILER EFFICIENCY TESTS IF AVAILABLE

APPLICABLE PARTICULATE EMISSIONS STANDARD — EPA May 1983 - PSAPCA* Sept 1994

ACTUAL PARTICULATE EMISSIONS — N/A

STACK TEMPERATURE (DEG F) — 150°f

STACK VOLUMETRIC FLOW RATE (ACFM) — 102,200 ACFM

AIR TEMP AT FD OR AIR-HEATING INLET (DEG F) — 70°-100°f Range

PREHEAT COMBUSTION AIR TEMP (DEG F) — N/A

FUEL TEMP AT BOILER BOUNDRY (DEG F) — 80°f

BOTTOM ASH TEMP AT BOILER BOUNDARY (DEG F) — 300°-600°f

FLY ASH TEMP AT BOILER BOUNDARY (DEG F) — 340°f

* PSAPCA - Puget Sound Air Pollution Control Agency

ECONOMIC INFORMATION

BASIC UNBURDENED OPERATOR WAGERATE ($/HR) $ 13.68

BURDENING ON BASIC WAGE RATE, A MULTIPLIER 1.305

COST OF CONVENTIONAL FUEL ($/TON) $ 78/TON

COST OF ELECTRICITY ($/KWH) $0.0227 KWH

DISPOSAL COST FOR ASH ($/TON) $ 16/TON

STEAM DEMAND BY SHIFT BY SEASON BY DAY, AVERAGE HOURLY (BTU/HR)

SUMMER	SHIFT 1	SHIFT 2	SHIFT 3
MON-FRI	50,000	45,000	45,000
SAT	40,000	40,000	40,000
SUN	40,000	40,000	40,000
WINTER			
MON-FRI	150,000	140,000	135,000
SAT	130,000	130,000	130,000
SUN	130,000	130,000	130,000
SPRING AND FALL			
MON-FRI	100,000	92,500	90,000
SAT	85,000	85,000	85,000
SUN	85,000	85,000	85,000

DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE ($/TON) $ 16/TON

PROJECTED FUTURE DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE $ 25-30 TON 1987

PROJECTED LIFE OF LOCAL LANDFILL(S) 1996

ANNUAL GENERATION RATE OF BASE WASTES (TON/YR) 42,000 TON/YR

NAME AND PHONE NUMBER OF CONTACT PERSON IN CHARGE OF:

NAVAL WASTE DISPOSAL ACTIVITIES NAME JIM WILLIAMSON PHONE # 206-476-2427

LOCAL COMMUNITY OR COUNTY SOLID WASTE AUTHORITY NAME Brem Air Disposal PHONE # 206-479-1755

4 December 1985

From: Brian Pedersen, Naval Submarine Base, Bangor
To: Gary E. Smith, Systech Corporation

Subj: INPUT DATA FOR COST/BENEFIT OF CO FIRING WITH COAL IN STOKER FURNACES.

Ref: (a) Naval Civil Engineering Laboratory letter Ser L71/RMRRDF dated 24 October 1985

1. The accompanying information is provided as requested by reference (a).

2. Further questions may be addressed to the undersigned.

BRIAN PEDERSEN
C/O Naval Submarine Base Bangor
Bremerton, WA 98315

#.3

DEPARTMENT OF THE NAVY
NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CA 93043

IN REPLY REFER TO

3900
Ser L71/RMR RDF
24 October 1985

From: Commanding Officer, Naval Civil Engineering Laboratory, Port Hueneme, CA 93043

To: Commanding Officer, Naval Submarine Base, Bangor PWD (Code 821), Bremerton, WA

Subj: INPUT DATA REQUIRED FOR COST/BENEFIT MODELLING OF RDF FUELS FOR COFIRING WITH COAL IN STOKER FURNACES

Ref: (a) NAVFAC Energy Project Work Unit Z0371-01-421D/E
(b) Phonecon from NCEL R.M. Roberts to your office 24 OCT 85

Encl: (1) RDF/Coal Cofired Boiler Model Input Data Questionnaire

1. Enclosure (1) is transmitted for your completion. It is requested that the subject data be provided for use in reference (a) as explained by reference (b).

2. It is expected that there may be some difficulty with some of the model input information requested. Determination of the limits of information availability is an important consideration in the configuring of the RDF/Coal Cofired Boiler Model. We will therefore be as interested in examining what data you can supply us with as we will be in finding out what data you cannot. To ensure that our questions are clear and properly structured, we urge you to solicit as often as necessary the assistance of the contractor who is responsible for the final design of the model. He may be reached as follows:

Mr. Gary E. Smith
Systech Corporation
245 No. Valley Rd.
Xenia, OH 45385
(513) 372-8077 or (513) 429-2533

3. When you have completed the questionnaire, please mail it to the contractor. If there are any administrative issues that need attention, please contact me on A/V 360-4193, FTS 799-4193, or comm'l (805) 982-4193. We will appreciate having your questionnaire by 15 November 1985.

Richard M. Roberts
Chemical Engineer
Code L71

ENCLOSURE (1)

NAVAL BASE: Subase Bangor

BLD #: 2900

BOILER #: 1

PRIMARY CONTACT PERSON: Richard Jackson

TITLE: Supervisor

PHONE #: 206-396-6801

DESIGN FUEL INFORMATION

DESIGN TOTAL FUEL VALUE TO BOILER AT MCR (MAXIMUM CONTINUOUS RATING) (BTU/HR)	
DESIGN FUEL TYPE	Subbituminous or bituminous coal
HIGHER HEATING VALUE OF DESIGN FUEL (BTU/LB)	8,400 to 13000 Btu
FRACTIONAL ASH CONTENT OF DESIGN FUEL, AS-RECIEVED	6% to 8% min
FRACTIONAL MOISTURE CONTENT OF DESIGN FUEL	10%
HYDROGEN MASS FRACTION OF AS-RECIEVED DESIGN FUEL	
SPECIFIC HEAT OF DESIGN FUEL	
DESIGN CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	
DESIGN RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	
DESIGN TEMPERATURE OF DESIGN FUEL AT BOILER BOUNDARY (DEG F)	
DESIGN EXCESS AIR REQUIRED FOR DESIGN FUEL AT MCR (%)	

A-15

CURRENT FUEL INFORMATION

CURRENT FUEL TYPE	bituminous coal
CURRENT FUEL VALUE TO BOILER AT MCR (BTU/HR)	
(FOR THE FOLLOWING, SUPPLY FUEL ANALYSIS REPORT IF AVAILABLE)	
HIGHER HEATING VALUE OF CURRENT FUEL (BTU/LB)	12300
FRACTIONAL ASH CONTENT OF CURRENT FUEL, AS-RECIEVED	7.5%
FRACTIONAL MOISTURE CONTENT OF CURRENT FUEL	5.1%
HYDROGEN MASS FRACTION OF AS-RECD CURRENT FUEL	
SULFUR MASS FRACTION OF AS-RECD CURRENT FUEL	.6%
SPECIFIC HEAT OF CURRENT FUEL	
CURRENT CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	
CURRENT RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	
TEMPERATURE OF CURRENT FUEL AT BOILER BOUNDARY (DEG F)	
EXCESS AIR REQUIRED FOR CURRENT FUEL AT MCR (%)	
MAXIMUM BOILER TURNDOWN ACHIEVABLE WITH CURRENT FUEL (%)	16%
EXCESS AIR REQUIRED FOR CURRENT FUEL AT NEAR MAXIMUM TURNDOWN (%)	

BOILER AND EQUIPMENT INFORMATION

FOR THE FOLLOWING, GIVE THE MANUFACTURER, EQUIPMENT DESCRIPTION AND RATED CAPACITIES OR THROUGHPUTS

FUEL FEED SYSTEM	Detroit spreaden stokers
GRATE SYSTEM	Detroit traveling Grate
ASH HANDLING SYSTEM	United conveyor Pneumatic system
MULTICLONES OR CYCLONES	N/A
SCRUBBERS	N/A
ESP	Belco model 27(999) 1x10-3 Electrostatic precipitat
BAGHOUSE	N/A

IS THE BOILER EQUIPPED WITH :

AN ID FAN — Yes

SOOTBLOWERS FOR THE CONVECTIVE — yes

AN ECONOMIZER — Yes

SOOTBLOWERS FOR THE ECONOMIZER — yes

WHAT TYPE OF ECONOMIZER TUBES? — Straight

OPERATIONS INFORMATION

AVAILABILITY OF EXISTING BOILER FIRED WITH CURRENT FUEL (%) — 94%

DOES ADEQUATE BACKUP CAPABILITY EXIST — yes

DOES BOILER HAVE A HISTURY OF SLAGGING — NO

FOR THE FOLLOWING, SUPPLY TEST REPORTS ON PARTICULATE EMISSIONS COMPLIANCE OR BOILER EFFICIENCY TESTS IF AVAILABLE

APPLICABLE PARTICULATE EMISSIONS STANDARD —

ACTUAL PARTICULATE EMISSIONS —

STACK TEMPERATURE (DEG F) — 335°F

STACK VOLUMETRIC FLOW RATE (ACFM) — 33,350

AIR TEMP AT FD OR AIR-HEATING INLET (DEG F) — Ambient

PREHEAT COMBUSTION AIR TEMP (DEG F) —

FUEL TEMP AT BOILER BOUNDRY (DEG F) —

BOTTUM ASH TEMP AT BOILER BOUNDARY (DEG F) —

FLY ASH TEMP AT BOILER BOUNDARY (DEG F) —

pm

ECONOMIC INFORMATION

BASIC UNBURDENED OPERATOR WAGERATE ($/HR) _____

BURDENING ON BASIC WAGE RATE, A MULTIPLIER _____

COST OF CONVENTIONAL FUEL ($/TON) $ 25.50 TON FOR COAL

COST OF ELECTRICITY ($/KWH) $ 28.06 PER MWH

DISPOSAL COST FOR ASH ($/TON) $4.00 YARD

STEAM DEMAND BY SHIFT BY SEASON BY DAY, AVERAGE HOURLY (BTU/HR)

SUMMER	SHIFT 1	SHIFT 2	SHIFT 3
MON-FRI	16,160,000	16,160,000	16,160,000
SAT	14,800,000	14,800,000	14,800,000
SUN	14,000,000	14,000,000	14,000,000
WINTER			
MON-FRI	31,735,000	31,735,000	31,735,000
SAT	27,475,000	27,475,000	27,475,000
SUN	26,300,000	26,300,000	26,300,000
SPRING AND FALL			
MON-FRI	27,220,000	27,220,000	27,220,000
SAT	24,975,000	24,975,000	24,975,000
SUN	23,400,000	23,400,000	23,400,000

DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE ($/TON) $4.00 YARD

PROJECTED FUTURE DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE _____

PROJECTED LIFE OF LOCAL LANDFILL(S) _____

ANNUAL GENERATION RATE OF BASE WASTES (TON/YR) 4400

NAME AND PHONE NUMBER OF CONTACT PERSON IN CHARGE OF:

NAVAL WASTE DISPOSAL ACTIVITIES NAME _____ PHONE # _____

LOCAL COMMUNITY OR COUNTY SOLID WASTE AUTHORITY NAME Brunswick Landfill PHONE # 674-2334

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA 28533

11300
LCU
19 NOVEMBER 1985

Systech Corporation
Attn: Mr. Gary E. Smith
245 North Valley Road
Xenia, Ohio 45385

Gentlemen:

Enclosed is the input data questionnaire required for cost/benefit modelling of RDF fuels for cofiring with coal in stoker furnaces.

Any questions concerning the information provided may be directed to Mr. John Parsons, 1-(919)-466-2890.

Sincerely,

S. W. Miko

STEPHEN W. MIKO
Deputy Facilities Maintenance Officer
By direction of the
Commanding General

Encl:
(1) RDF/Coal Cofired Boiler Model Input Data, Completed Questionnaire

Copy to:
Commanding Officer
(Attn: Mr. Richard M. Roberts, Code L71)
Naval Civil Engineering Laboratory
Port Hueneme, CA 93043

A-1

ENCLOSURE (1)

NAVAL BASE	Marine Corps Air Station, Cherry Point, NC
BLD #	Building #152
BOILER #	No. 1 and No. 2
PRIMARY CONTACT PERSON	John M. Parson
TITLE	Boiler Plant Operator, Foreman
PHONE #	1-(919)-466-2890

DESIGN FUEL INFORMATION

DESIGN TOTAL FUEL VALUE TO BOILER AT MCR (MAXIMUM CONTINUOUS RATING) (BTU/HR)	110,000,000/Blr
DESIGN FUEL TYPE	Coal
HIGHER HEATING VALUE OF DESIGN FUEL (BTU/LB)	14,724
FRACTIONAL ASH CONTENT OF DESIGN FUEL, AS-RECIEVED	10%, maximum
FRACTIONAL MOISTURE CONTENT OF DESIGN FUEL	10%, maximum
HYDROGEN MASS FRACTION OF AS-RECIEVED DESIGN FUEL	5.39
SPECIFIC HEAT OF DESIGN FUEL	13,000 BTU/min
DESIGN CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	79.46%
DESIGN RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	0.53%
DESIGN TEMPERATURE OF DESIGN FUEL AT BOILER BOUNDARY (DEG F)	80°
DESIGN EXCESS AIR REQUIRED FOR DESIGN FUEL AT MCR (%)	15%

CURRENT FUEL INFORMATION

CURRENT FUEL TYPE	Coal
CURRENT FUEL VALUE TO BOILER AT MCR (BTU/HR)	91,000,000
(FOR THE FOLLOWING, SUPPLY FUEL ANALYSIS REPORT IF AVAILABLE)	
HIGHER HEATING VALUE OF CURRENT FUEL (BTU/LB)	14,724
FRACTIONAL ASH CONTENT OF CURRENT FUEL, AS-RECIEVED	6%
FRACTIONAL MOISTURE CONTENT OF CURRENT FUEL	4.50%
HYDROGEN MASS FRACTION OF AS-RECD CURRENT FUEL	1.41
SULFUR MASS FRACTION OF AS-RECD CURRENT FUEL	0.68
SPECIFIC HEAT OF CURRENT FUEL	13,000/min
CURRENT CARBON LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	51%
CURRENT RADIATION LOSSES AS PERCENT OF MAXIMUM FUEL VALUE TO BOILER AT MCR	0.74
TEMPERATURE OF CURRENT FUEL AT BOILER BOUNDARY (DEG F)	70%
EXCESS AIR REQUIRED FOR CURRENT FUEL AT MCR (%)	17%
MAXIMUM BOILER TURNDOWN ACHIEVABLE WITH CURRENT FUEL (%)	33%
EXCESS AIR REQUIRED FOR CURRENT FUEL AT NEAR MAXIMUM TURNDOWN (%)	21%

BOILER AND EQUIPMENT INFORMATION

FOR THE FOLLOWING, GIVE THE MANUFACTURER, EQUIPMENT DESCRIPTION AND RATED CAPACITIES OR THROUGHPUTS

FUEL FEED SYSTEM	Roto grate Stoker
GRATE SYSTEM	Detroit Stoker Company
ASH HANDLING SYSTEM	Allen Sherman Hoff
MULTICLONES OR CYCLONES	Multiclone
SCRUBBERS	NO
ESP	YES
BAGHOUSE	NO

IS THE BOILER EQUIPPED WITH :

AN ID FAN	YES
SOOTBLOWERS FOR THE CONVECTIVE	YES
AN ECONOMIZER	YES
SOOTBLOWERS FOR THE ECONOMIZER	YES
WHAT TYPE OF ECONOMIZER TUBES?	Honz-SA-178-A-fin

OPERATIONS INFORMATION

AVAILABILITY OF EXISTING BOILER FIRED WITH CURRENT FUEL (%)	As needed (95+%)
DOES ADEQUATE BACKUP CAPABILITY EXIST	YES
DOES BOILER HAVE A HISTURY OF SLAGGING	NO

FOR THE FOLLOWING, SUPPLY TEST REPORTS ON PARTICULATE EMISSIONS COMPLIANCE OR BOILER EFFICIENCY TESTS IF AVAILABLE

APPLICABLE PARTICULATE EMISSIONS STANDARD	State of North Carolina
ACTUAL PARTICULATE EMISSIONS	1.2lbs/million BTU
STACK TEMPERATURE (DEG F)	540°F
STACK VOLUMETRIC FLOW RATE (ACFM)	36,000
AIR TEMP AT FD OR AIR-HEATING INLET (DEG F)	70°F
PREHEAT COMBUSTION AIR TEMP (DEG F)	NONE
FUEL TEMP AT BOILER BOUNDRY (DEG F)	70°F
BOTTOM ASH TEMP AT BOILER BOUNDARY (DEG F)	150°F
FLY ASH TEMP AT BOILER BOUNDARY (DEG F)	120°F

ECONOMIC INFORMATION

BASIC UNBURDENED OPERATOR WAGERATE ($/HR) Average $13.50/hr

BURDENING ON BASIC WAGE RATE, A MULTIPLIER 30%

COST OF CONVENTIONAL FUEL ($/TON) $54.74/ton

COST OF ELECTRICITY ($/KWH) $53.50/MWH

DISPOSAL COST FOR ASH ($/TON) MCAS Landfill on Station

STEAM DEMAND BY SHIFT BY SEASON BY DAY, AVERAGE HOURLY (BTU/HR)

SUMMER	SHIFT 1	SHIFT 2	SHIFT 3
MON-FRI	46000	44000	44000
SAT	45000	43000	43000
SUN	45000	43000	43000
WINTER			
MON-FRI	225000	198000	198000
SAT	207000	191000	191000
SUN	207000	191000	191000
SPRING AND FALL			
MON-FRI	75000	72000	72000
SAT	73000	70000	70000
SUN	73000	70000	70000

DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE ($/TON) $3.40 plus $6.00/T Transport

PROJECTED FUTURE DISPOSAL COST FOR MUNICIPAL SOLID WASTE OR BASE WASTE Increase 5%/year

PROJECTED LIFE OF LOCAL LANDFILL(S) 5+ years

ANNUAL GENERATION RATE OF BASE WASTES (TON/YR) 10,000T/year

NAME AND PHONE NUMBER OF CONTACT PERSON IN CHARGE OF:

NAVAL WASTE DISPOSAL ACTIVITIES NAME E. E. Smith PHONE # 919-466-4139

LOCAL COMMUNITY OR COUNTY SOLID WASTE AUTHORITY NAME G. B. Sawyer, Asst. County Mgr., Craven County, NC PHONE # 919-637-3338

APPENDIX B

TELEPHONE LOGS

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 2/28 Time _____

To/From: NAME Refuse collection dispatch

COMPANY Sub-base Bangor Waste data Phone 206-396-4210

Subject _____

Referred by Dick Jackson

206 - 396 - 4216 EXT 320 Transportation Office/Director Public Works

Dave Amos - EXT 340 206-396-4216

Refered to Environmental

Hayden Street EXT 251 : 206-396-4216

10,000 people
1 ccc TPY Haz
3,111 TPY Indust

→ they don't maintain wt or vol records

→ landfilled @ Bremerton - Private City Sanitary Landfill

10,000 x 3#/per/day x 365
5,475 TPY
EST. 5500 TPY ?

→ charged per truck-load

→ some are compacted, others aren't

→ Includes sandblast & asbestos will be under special permit

→ No on site disposal

Future contact date _____

By Helen Belencan

They have done an energy evaluation
Dale Waggeneir 206-396-4192

SYSTECH TELEPHONE/VISIT RECORD

Project 8017-20 Sales _____ Date 2/10 Time 12:00

To/From: NAME Brian Pedersen

COMPANY Sub-base Bangor WA Phone 206-396-4235

Subject Completion of boiler survey

Out until 10:30. Left return call message
Called back @ 4:00 EST - not in - has message

2/11 Acceptance test - talk to boiler inspector
Rudy Clark - does not have copy of
acceptance - Keeler Boiler
San Bruno - Public Work 415-877-7506
HDQ John Johnston

Dick Jackson - 206-396-6801
in charge of boiler

Ash handling system out of commission currently

O_2 { 11% @ low loads now ~ 95% EA
9% @ max ~ 65% EA

Stack tests by San Bruno - $

Future contact date _____

By Helen Belencan

05

two-~~steam~~ turbine pumps
use exhaust ~~steam~~ in DA
& other heaters

Current coal contract
$43.80/T delivered

Last years coal
$25.50 @ mine
$93.64 delivered

.74851/gal oil

Pacific Basin Coal + Carbon Company

Moisture	5.1 %
Volatile	41 %
F. Carb	51.5 %
Ash	7.5 %
Sul	0.6 %

Operator wage rate - cannot release

SYSTECH®

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 1/8/86 Time 9:45

To/From: NAME John Parson

COMPANY Boiler Plant Operator, Cherry Point, NC Phone 919-466-2890

Subject Boiler data

Precipitators are out - process of rebuilding to start in Jan-Feb '86

Design carbon loss - should be 0.792 %, not 79.46% as indicated

Will assume compliance for model runs

- Current emissions with cyclones 1.2 lb/mm Btu
  @ 85% efficiency for cyclones, uncontrolled emissions would be 8 lbs/mm Btu
  w/ new ESP @ 98.5% and Cyclones, new emissions would be 0.02 lb/mm Btu
  INput 0.02 for current emissions
  [(1-.998) * 8 - 0.02]

Future contact date _____

By Helen Belencan

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 1-22-86 Time 11:15

To/From: NAME John Parson

COMPANY Cherry Point Marine Phone 919-466-2890

Subject _____

Capacity of ash handling system?

Vaccumm system - 75 T storage in hopper

6 in vac. line

60 T coal / day @ 6% ash

1.3 T/HR AT MCR

Future contact date _____

By Helen Belmeares

B-8

4 MCAS ✓

SYSTECH®

SYSTECH TELEPHONE/VISIT RECORD

Project ZZ07 Sales _____ Date 11-13-85 Time 1500

~~To~~/From: NAME JE Parker Facilities Maint Dept

COMPANY Marine Corps Air Station Phone 919-466-5334

Subject _____

(2 [illegible] or

11-7 No Answer 15.00
11-11 No Answer [illegible]
1-3 [illegible] return call

1500 - returned call
- have completed the forms as of last week
- the info is in the mail

- [illegible]
- calling any questions [illegible]

Future contact date _____

By Gary

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 2/28 Time _____

To/From NAME Dale Pluggeniss

COMPANY _____ Phone 206-396-4192

Subject Sub base Bangor data

Max Sneed - NCEL
Survey for NAVFAC of coal fired boilers will be @ Bangor Mar 10-11
Peat for coal fired boilers

5 yrs ago - Woodex - excessive dust
Poor economics

Currently looking at using wood chips & possibly tires

1 Studies of combustible waste
He will look for numbers

Air Pyber - West Difficulties - tire peat & wood & RDF in general

Engr -
He will call back with data

Future contact date _____

By Helen Gilmore

SYSTECH®

SYSTECH TELEPHONE/VISIT RECORD

Project 8017-20 Sales _____ Date 2/12 Time _____

To/From: NAME JW (Wickett)

COMPANY Sub base Bangor Phone _____

Subject Boiler Data

Proximate Analysis 8400 - 13000 Btu/lb

Design Fuel 10% Moist Ash fusion 2200°F
40% Vol
43% F.Carb
6-8% Ash
0.5 - 1.0% Sul
12,000 Btu/lb

Source - operation & maintenance instructions exec. summary

Questions raised (answered) 1-4-78 Acceptance Test

Excess Air 32.15 CO_2 13.3%
O_2 5.31%

Answers given (received)

CO 0.0%

Hydrogen 0.061 N_2 21.39

Unresolved items

~~Ash~~
~~Moist~~

Heat loss dry gas 8.84%
Moist 1.01
H_2O 4.41
unb. carb 0.38
radiation 0.52
unmeas. 1.42
efficiency 83.42

Action(s) to be taken #41 13107

#28 5300 lb/HR
#28 77331 KBtu/hr

Future contact date _____

By _____

SYSTECH®

SYSTECH TELEPHONE/VISIT RECORD

Project 8017-20 Sales ______ Date 1-31-86 Time 2:20

To/From: NAME Curt Wexel - Engineering

COMPANY Naval Amphibious Base Little Creek Phone 804-464-7302

Subject ______

Not in - left message to return call

29 year old

RDF Boiler at PWC -> Naval Ship Yard

NEESA 32-017 Report - Boiler Performance Eval Feb 85

805-982-4758

K. Fanning

Request Report from [illegible] 1/31/86

Questions raised (answered)

Fiscal 85 Net 61,272 M lbs steam — Export

1985 Gross Steam production = 73332.56 MBtu

+ 18% in plant

Answers given (received)

Ash 7,337 Cu yds

$15.38/cu yd

Unresolved items

Cost of Steam 3.97/MBtu Operations Only

No labor

Action(s) to be taken

Future contact date ______

By H Belencan

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 2/20 - 2/21 - 86 Time _____

To/From NAME Mike Roberts

COMPANY NCEL Phone _____

Subject Hottle Creek boiler data

1. Ash disposal $15.38/cubic yard
2. Solid waste - charged per pick-up annually: $102,370.00
3. Ash temperatures unknown - dry system, estimate based on similar facility
4. Solid waste generation: 28-29 T/day, 5 day/wk

Questions raised (answered)

Answers given (received)

Unresolved items

Action(s) to be taken

Future contact date _____

By Helen Belencan

Little Creek

SYSTECH TELEPHONE/VISIT RECORD

Project 8017-20 Sales _____ Date 1/30/86 Time 2:10

To/From: NAME Robert Acra

COMPANY Naval Amphibious Phone 804-464-8675

Subject _____

Steam Demand

AVG WINTER 150,000 lbs/hr – might be lower
Summer 60,000 lb/hr
Spring/Fall 100,000 lb/hr

Referred to:

→ Fred Tody 464-7851
- Engineering dept Curt Wexel 464-7302

Questions raised (answered)

Answers given (received)

Unresolved items

Action(s) to be taken

Future contact date _____

By _____

SYSTECH TELEPHONE/VISIT RECORD

Project 8017 Sales _____ Date 1/30/86 Time 3:00

To/From: NAME _____

COMPANY ~~Ecology Dept - Haz Waste & Air~~ Phone ~~206-459-6023~~

Subject Puget Sound particulate emissions standards

Puget Sound Air Pollution Control Agency - 206-383-5851

.05 grs/dscf - includes impinger & filter catch

2.2 x .05 = 0.11 lb/mmBtu

Questions raised (answered)

Answers given (received)

Unresolved items

Action(s) to be taken

Future contact date _____

By H Belencan

B15

SYSTECH SOLID-WASTE-TO-ENERGY
SALES CALL REPORTING FORM

___ PHONE CALL DATE 8/14/85 TIME _____
X VISIT COMPANY CAG Partnership, Henrico Co. Va
___ LETTER/BROCHURE CONTACT PERSON Steve Coe

SYSTECH SALESPERSON: Richard Fromfelter

SUMMARY OF SALES CALL

Plant rebuilt several time
Current line processes Industrial and MSW in separate lines, mixed at final shredder before pellet mills
Proces Line - hand pick, load by front loader primary shred, disk screen, ferrous magnet, secondary shred 50/50 mix MSW to industrial
Pellet Mills - about 5 TPH from each mill ≈ 1¼ cubes, 10 TPH is desired rate if possible
Cost - Price of $18/Ton delivered to sale pudins was given

APPENDIX C

MODIFICATIONS TO THE NCEL RDF COST MODEL

APPENDIX C
MODIFICATIONS TO THE NCEL RDF COST MODEL

Modifications

As discussed in Section 3.2, twelve modifications were necessary to correct transcription and logic errors in the RDF Cost Model. Two additional modifications were implemented to facilitate data entry. The first was a reorganization of the input data sheet (RDFMDLIN). The original format did not follow a logical sequence. It had requests for information on the same topic scattered throughout the sheet. The inputs are now grouped into the following categories: current boiler operating conditions, conventional fuel characteristics, RDF characteristics, economic factors, true/false questions, and original boiler design information. The second change was to clarify the wording of two of the true/false questions. Line 73 "The boiler has no history of slagging" was changed to "The boiler has a history of slagging," and Line 86 "The boiler has no ID fan" was changed to "The boiler has an ID fan." This re-wording eliminates the potential confusion caused by the use of a negative statement. The original algorithm and the modified final version are summarized in Table C-1 and discussed below.

Modification 1. Three errors that were identified were transcription errors in which the algorithms in the final model differed from the algorithms proposed by WETCO.

1(a). To accommodate additional ash which may be generated during co-firing the model estimates the cost of upgrading the existing ash handling system or develops a cost for a new system if one does not currently exist. The logic for assigning the cost of a new system was reversed. The model assigned a cost multiplier of 10 if an ash handling system was in place and a multiplier of 1 if there was not an ash handling system. These multipliers are applied correctly in the final version.

1(b). The model contains an algorithm which computes the total hours when co-firing is possible. Two of the intermediate sums were added twice, thus incorrectly stating the grand total. This was corrected by eliminating the duplicate values.

1(c). A portion of the algorithm for derating the boiler during co-firing was inverted, resulting in a negative value. This was corrected by putting the factors in the proper order.

Modification 2. The original algorithm for determining air pollution control (APC) device efficiency assumed that various APC devices are mutually exclusive. In actual practice, APC devices are not mutually exclusive; they are commonly used in conjunction with one another to achieve

TABLE C-1. RDF COST MODEL MODIFICATIONS LIST

Modification Number	Sheet Name	Row #	Column #	Description
1	WORK1	84	2	((r1c1-r11c1/r1c1)*100
	WORK1	89	3	(520*SUM(r62:64c3,r71:73c3,r80:82c3))+ (104*SUM(r65:70c3,r74:79c3,r83:88c3))
	WORK2	46	5	(if(r59c1=1,1,10))*(r96c4/100000000* r21c1/0.2*r26c5/r9c5/2000)^0.261*32461
2	WORK2	21	5	(1-((if(r53c1=1,0.01,1))*(if(r54c1=1,0.015, 1,))*(if(r55c1=1,0.05,1))* (if(r56c1=1,0.15,1))))
3	WORK1	57	3	if(r67c1=1,0.25.0.6)*r1c1/r11c1
4	WORK1	80	2	if(r67c1=1,r15c1,(r15c1+r23c1+0.5*r24c1 -r13c1-0.5*r14c1+(r25c1/0.75)^0.67*0.05))
5	WORK2	42	5	if(r67c1=1,0.25,1)*((5/r26c1*r96c4*r9c5/ r1c5*r36c1*24/40)^0.39*672000
	RDFMDLIN	52	6	Input 1 day storage
6	WORK2	45	5	(if(r66c1=1,1,0.3))*((r21c1/0.2 *r96c4/100000000)^0.368*259691)
7	WORK2	46	5	if (and(r59c1=1,r26c5<=(1.25*r96c1)), 0,10)*(r96c4/100000000*r21c1/0.2*r26c5 /r9c5/2000)^0.261*32461
	RDFMDLIN	37	6	Input ash handling capacity in TPH
8	WORK2	43	5	if(r37c1<=0.0189,0,(5/r26c1*r21c1/ 0.1*(r96c4/150000000))^0.274 *r37c1/0.25*1125000
	WORK2	44	5	(if(and(r37c1<=0.0189,r37c1=0),0,(5/r26c1* r21c1/0.2*(r96c4/100000000))^0.508*64923)
	RDFMDLIN	53	6	Input 0 length
9	WORK2	13	5	(r97c1/(1-r21c5))/(r26c5/(r2c5/1000000))
	RDFMDLIN	35	6	Input current particulate emissions,lb/mmBtu
10	RDFMDLIN	57	6	Input discount factor
	WORK2	51	5	R39c1
	WORK2	52	5	blank
	WORK2	54	5	blank
	WORK2	56	5	((r98c5-r57c5)*r39c1)/(r50c5/(r35c5/1000000)
11	WORK2	99	5	(r45c1)*(r43c1/2)
	WORK2	100	5	(r98c5-r102c5)*r39c1/(r50c5/(r35c5/1000000))
	WORK2	101	5	r53c5-r99c5
	WORK2	102	5	r101c5*1000000/r35c5
	OUT4	68	3	r99c12
	OUT4	69	3	r100c12
	RDFMDLIN	63	6	Input MSW tipping fee, $/ton
	RDFMDLIN	64	6	Input MSW transportation cost, $/ton
12	RDFMDLIN	34	6	Input boiler exit temperature, deg F
True/false	WORK2	33	5	((If(r51c1=1,0.46,0.036))*...(unchanged)
	WORK2	80	5	(if(r64c1=1,1,0))*...(unchanged)

a cumulative particulate removal efficiency. For example, it is not uncommon to have multiclones followed by an ESP (Cherry Point) or to have a scrubber and a baghouse (Puget Sound). The erroneous algorithm added the individual efficiencies when two devices were present, yielding an efficiency of greater than 100 percent. The algorithm was modified to reflect the cumulative efficiency of multiple APC devices.

Modification 3. The original algorithm for determining co-fire boiler flows at maximum turndown was biased towards RDF-3 utilization. When co-firing RDF-3, it is not generally possible to maintain stable combustion at boiler loads of less than 60 percent of the design MCR. However, field test co-fire evaluations at Hagerstown, Maryland; Erie, Pennsylvania; and Wright-Patterson Air Force Base, Ohio (References 6, 7, and 8), respectively, have demonstrated the ability to successfully co-fire RDF-5/Coal as low as 25 percent of design ratings. The algorithm assumed maximum turndown to be 60 percent of MCR irrespective of the type of RDF specified in the input data. Since 60 percent is appropriate for RDF-3, the algorithm was modified to use either 60 percent or 25 percent, depending on the type of RDF utilized.

Modification 4. The algorithm for estimating excess air requirements did not appropriately address excess air requirements for co-firing RDF-5. The algorithm estimated excess air based on RDF-3 burned in suspension but not on RDF-5, which has essentially the same excess air requirements as coal (References 6, 7, and 8). To account for RDF-5 utilization, a logic gate was added which uses the existing algorithm when RDF-3 co-firing is specified or uses the excess air value which was input for coal when RDF-5 co-firing is specified.

Modification 5. RDF storage was based on the use of an Atlas storage silo. This is not appropriate for RDF-5 and may not even be the most appropriate for RDF-3 (Reference 11). RDF-5 is physically similar to coal and, therefore, can be stored in existing coal bunkers, silos, etc., with only minor modifications (Reference 8). The modified algorithm currently uses the initial Atlas storage cost calculation for RDF-3 but uses 25 percent of that storage cost for RDF-5. This results in an adequate amount of capital for one of several storage options appropriate for RDF-5. Furthermore, RDF storage should be limited to only a one day supply on hand at any given time since coal would still be available as the primary fuel.

Modification 6. The proposed system for delivering RDF from storage to the boiler is a pneumatic system. Although applicable to RDF-3, it is not appropriate for RDF-5. Unlike RDF-3, RDF-5 can be transferred from storage to the boiler on the same conveyors used for coal, with only minimal modifications required (Reference 7 and 8). The original algorithm priced out an entirely new delivery system for either RDF-3 or RDF-5. The portion of the algorithm which priced the RDF-3 pneumatic delivery system was left intact, but it was appended with a subordinate algorithm which applies one-third the cost calculated for the pneumatic system when RDF-5 is specified.

Modification 7. As addressed in Modification 1(a), the model did account for the potential need to upgrade the existing ash handling system to accommodate the additional ash associated with RDF co-firing. However, that algorithm assumed that an upgrade would always be necessary. There was no check to compare the co-fire ash generation rate to the capacity of the current ash handling system, thereby verifying the need for upgrading. This problem was addressed by adding an additional model input to identify the design capacity of the ash handling system and a logic gate to compare the co-fire ash generation rate against the system capacity. If the co-fire ash generation is more than 125 percent of design ash capacity, the cost to upgrade the ash system is calculated as before; otherwise, no additional cost is assigned for ash handling system modifications.

Modification 8. The model contained an algorithm which estimated capital costs for long or short conveyors. This was used to establish an RDF delivery cost and was based on the assumption that the RDF production plant is on base, near the boiler. In this situation, it would be more appropriate to assign the cost of the delivery conveyors to the RDF producer, incorporate any additional cost into the delivered RDF price, and avoid addressing RDF delivery cost as a separate item. In many instances, the production facility may not be near the base and transportation would be via truck. Thus, the algorithm was modified to yield a zero cost for RDF delivery via conveyors and to assume the input RDF price includes delivery costs.

Modification 9. The original model estimated a theoretical flyash fraction as a function of furnace velocity only. Although that approach is not incorrect, flyash fraction can be more accurately estimated by back-calculating it based on the following: (current particulate emissions)/(1-APC efficiencies) = total ash lofted as flyash. This assumes that the flyash fraction is constant and that APC efficiencies are constant. A model input for the current emissions rate was also added.

Modification 10. The original SIR algorithm did not follow Military Specification, NAVFAC P-442 (Reference 5). The SIR algorithm used an annualized capital cost based on annual interest rate and represented only the first year costs. It did not yield the return on investment (ROI) over the life of the project, which in this case is 25 years. To correct this, the SIR was changed to a Type I SIR analysis. A Type I analysis is utilized when "a given requirement is already being met at the present time, but a better solution is perceived. In the context of economic analysis, 'better' specifically refers to a proposed alternative whose total NPV [net present value] cost is lower than that of the existing alternative (the status quo) over the same period (project life). In such a case, the justification for implementing the proposed alternative is primarily economic...." (page 28, Economic Analysis Handbook, NAVFAC P-442, July 1980).

Modification 11. To account for the utilization of base-generated solid waste to support an RDF production facility, an algorithm was added which applies a credit to the SIR algorithm for avoided solid waste disposal cost. Therefore, for each analysis, two SIRs are estimated; one includes the credit for avoided cost, and one does not. The estimate of avoided cost is based on the following assumptions: transportation and collection costs cannot be

avoided. The solid waste still has to be collected and then transported, whether to landfill or to the RDF production facility. Furthermore, only one-half of the disposal cost can be avoided because RDF production facilities typically have a 50 percent fuel, 50 percent rejects ratio. The rejects must still be landfilled.

Modification 12. The model originally used the flue gas temperature at the stack for the boiler efficiency calculation. This can lead to erroneous results, especially if a wet scrubber is used, which lowers the flue gas temperature without reclaiming the energy. The ASME Power Test Code efficiency test uses the flue gas temperature at the boiler, economizer, or air preheater exit. To correct this, the model input was changed to ask for boiler exit temperature rather than stack temperature. The algorithm was correct in all other respects and was, therefore, left unchanged.

The following computer printouts are the output data obtained as each modification was implemented. The outputs show the individual effects of each modifications as well as the final, cumulative effects. Modifications 1 through 11 are based on Cherry Point data. Modification 12 is illustrated with Puget Sound data, as Puget Sound was the only facility affected by this modification. The individual outputs, which were effected by the modification, are underlined and can be compared to the original program (Run 1 outputs).

Summary of Out 4 data		Original Program		Modification #1		Modification #2		Modification #3		Modification #4	
		Run #1		Basic errors		APC efficiency		Max turndown		Excess air	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	7.48E+07	7.48E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	4.91E+07	4.91E+07	5.30E+07	5.30E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	7.97E+07	7.47E+07	7.97E+07	7.47E+07	7.97E+07	7.47E+07	7.97E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	4.70E+07	NA	4.70E+07	NA	4.70E+07	NA	1.96E+07	NA	4.76E+07	NA
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.73	0.82	0.75	0.82	0.75	0.82	0.74	0.82	0.76	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	1.02E+08	9.12E+07	6.80E+07	6.18E+07	6.80E+07	6.18E+07	6.61E+07	5.99E+07	7.00E+07	6.46E+07
RDF FLOWRATE, AVERAGE	TPH	3.24	NA	2.16	NA	2.16	NA	2.10	NA	2.22	NA
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	4153	6193	2769	4196	2769	4196	2693	4065	2853	4389
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1248	410	777	277	777	277	768	269	786	290
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.28	0.09	0.23	0.09	0.23	0.09	0.24	0.09	0.22	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.42	0.29	0.42	0.29	0.42	0.29	0.42	0.29	0.42	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	-415	-98	-415	-98	1	0	-415	-98	-446	-98
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	-3.92	-1.07	-3.92	-1.07	0.01	0.00	-3.92	-1.07	-3.91	-1.07
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	4.69	1.28	4.69	1.28	4.69	1.28	4.69	1.28	4.69	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	94616	77885	63091	52764	63091	52764	61355	51120	59789	55196
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	21026	17308	14020	11725	14020	11725	13634	11360	13287	12266
WET FLUE GAS RATE, AVERAGE	LB/HR	103991	83669	69398	56682	69398	56682	67476	54916	66300	59295
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	47361	25588	21893	17334	21893	17334	20550	22393	21758	18133
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	2	2	2	2	1	1	2	2	2	2
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0

Summary of Out \ data		Original Program		Modification #1		Modification #2		Modification #3		Modification #4	
		Run #1		Basic errors		APC efficiency		Max turndown		Excess air	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$2.63	$2.17	$1.76	$1.47	$1.76	$1.47	$1.71	$1.42	$1.66	$1.54
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$9.95	$0.00	$3.55	$0.00	$3.55	$0.00	$3.35	$0.00	$3.38	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$9.77	$0.00	$6.92	$0.00	$6.92	$0.00	$6.76	$0.00	$7.10	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1169	409	1170	409	1170	409	1170	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.5	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$114	$170	$76	$115	$76	$115	$74	$111	$78	$120
RDF FUEL COST, AVERAGE	$/HR	$81	NA	$54	NA	$54	NA	$52	NA	$56	NA
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	4717	6224	4717	6224	4717	6224	6290	8299	4717	6224
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$220445	NA	$88660	NA	$88660	NA	$88720	NA	$91274	NA
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.53E+11	4.66E+11	2.39E+11	3.16E+11	2.39E+11	3.16E+11	3.09E+11	4.08E+11	2.50E+11	3.30E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$105445	$13488	$57711	$9138	$57711	$9138	$74327	$11805	$57315	$9559
ANNUAL CONVENTIONAL FUEL COST	$/YR	536779	1056253	357931	715567	357931	715567	464113	924365	368721	748548
ANNUAL RDF FUEL COST	$/YR	$381548	NA	$254421	NA	$254421	NA	$329896	NA	$262090	NA
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	NA	$94000	NA	$94000	NA	$94000	NA	$94000	NA	$94000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	NA	0	NA	0	NA	0	NA	0	NA
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	4.69	NA	4.69	NA	4.69	NA	4.69	NA	4.69	NA
INCLUDED IN CAPITAL COST											
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$547129	NA	$543797	NA	$543797	NA	$544595	NA	$558624	NA

C/O

Summary of Out 4 data		Original Program Run #1		Modification #1 Basic errors		Modification #2 APC efficiency		Modification #3 Max turndown		Modification #4 Excess air	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$162283	NA	$162291	NA	$162291	NA	$162291	NA	$166085	NA
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$400705	NA	$400731	NA	$400731	NA	$400731	NA	$413363	NA
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$234549	NA	$26074	NA	$26074	NA	$26265	NA	$26952	NA
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0	NA	$0	NA	$0	NA	$0	NA	$0	NA
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$327229	NA	$327251	NA	$327251	NA	$327251	NA	$338165	NA
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$1671894	NA	$1460145	NA	$1460145	NA	$1461133	NA	$1503189	NA
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$2206900	NA	$1927391	NA	$1927391	NA	$1928695	NA	$1984209	NA
CAPITAL RECOVERY FACTOR	NONE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ANNUALIZED COST OF CAPITAL	$/YR	$281380	NA	$245742	NA	$245742	NA	$245909	NA	$252987	NA
TOTAL ANNUAL O&M COST	$/YR	$1558273	$1296518	$1072777	$951482	$1072777	$951482	$1271112	$1162947	$1093454	$984884
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$1839652	$1296518	$1318520	$951482	$1318520	$951482	$1517020	$1162947	$1346441	$984884
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$5.21	$2.78	$5.51	$3.02	$5.51	$3.02	$4.91	$2.85	$5.38	$2.98
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.05	NA	-1.43	NA	-1.43	NA	-1.58	NA	-1.37	NA
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.41	$2.78	$4.49	$3.02	$4.49	$3.02	$4.11	$2.85	$4.37	$2.98
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA
TONS PER YEAR RDF REQUIRED	TPY	15262	NA	10177	NA	10177	NA	13196	NA	10484	NA

Summary of Out 4 data		Modification #5		Modification #6		Modification #7		Modification #8		Modification #9	
		RDF storage		RDF delivery		Ash handling		Delivery cost added,		Flyash fraction	
variable								Long/short conv. del.			
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07	5.07E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	7.97E+07	7.47E+07	7.97E+07	7.47E+07	7.97E+07	7.47E+07	7.97E+07	7.47E+07	7.97E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	4.70E+07	NA	4.70E+07	NA	4.70E+07	NA	4.70E+07	NA	4.70E+07	NA
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00	NA
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.80E+07	6.18E+07	6.80E+07	6.18E+07	6.80E+07	6.18E+07	6.80E+07	6.18E+07	6.80E+07	6.18E+07
RDF FLOWRATE, AVERAGE	TPH	2.16	NA	2.16	NA	2.16	NA	2.16	NA	2.16	NA
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2769	4196	2769	4196	2769	4196	2769	4196	2769	4196
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	777	277	777	277	777	277	777	277	777	277
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.23	0.09	0.23	0.09	0.23	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.42	0.29	0.42	0.29	0.42	0.29	0.42	0.29	0.54	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	-415	-98	-415	-98	-415	-98	-415	-98	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	-3.92	-1.07	-3.92	-1.07	-3.92	-1.07	-3.92	-1.07	0.02	0.00
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	4.69	1.28	4.69	1.28	4.69	1.28	4.69	1.28	6.01	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	63091	52764	63091	52764	63091	52764	63091	52764	63091	52764
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	14020	11725	14020	11725	14020	11725	14020	11725	14020	11725
WET FLUE GAS RATE, AVERAGE	LB/HR	69398	56682	69398	56682	69398	56682	69398	56682	69398	56682
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	21893	17334	21893	17334	21893	17334	21893	17334	21893	17334
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	2	2	2	2	2	2	2	2	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0

Summary of Out A data

variable definition	UNITS	Modification #5 RDF storage		Modification #6 RDF delivery		Modification #7 Ash handling		Modification #8 Delivery cost added, conc/short conv. del.		Modification #9 Flyash fraction	
		RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.76	$1.47	$1.76	$1.47	$1.76	$1.47	$1.76	$1.47	$1.76	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.55	$0.00	$3.55	$0.00	$3.55	$0.00	$3.55	$0.00	$3.55	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.92	$0.00	$6.92	$0.00	$6.92	$0.00	$6.92	$0.00	$6.92	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1170	409	1170	409	1170	409	1170	409	1170	409
ANNUAL LABOR COST, BURDENED	$/YR	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$76	$115	$76	$115	$76	$115	$76	$115	$76	$115
RDF FUEL COST, AVERAGE	$/HR	$54	NA	$54	NA	$54	NA	$58	NA	$54	NA
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	4717	6224	4717	6224	4717	6224	4717	6224	4717	6224
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$61940	NA	$69943	NA	$102909	NA	$78806	NA	$88660	NA
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	2.39E+11	3.16E+11	2.39E+11	3.16E+11	2.39E+11	3.16E+11	2.39E+11	3.16E+11	2.39E+11	3.16E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$57711	$9138	$57711	$9138	$57711	$9138	$57711	$9138	$57711	$9138
ANNUAL CONVENTIONAL FUEL COST	$/YR	357931	715567	357931	715567	357931	715567	357931	715567	357931	715567
ANNUAL RDF FUEL COST	$/YR	$254421	NA	$254421	NA	$254421	NA	$274774	NA	$254421	NA
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	NA	$94000	NA	$94000	NA	$94000	NA	$94000	NA	$94000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	NA	0	NA	0	NA	0	NA	0	NA
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	4.69	NA	4.69	NA	4.69	NA	4.69	NA	6.01	NA
INCLUDED IN CAPITAL COST											
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$103747	NA	$543797	NA	$543797	NA	$543797	NA	$543797	NA

Summary of Out A data		Modification #5 RDF storage		Modification #6 RDF delivery		Modification #7 Ash handling		Modification #8 Delivery cost added, long/short conv. cei.		Modification #9 Flyash fraction	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$162291	NA	$162291	NA	$162291	NA	$0	NA	$162291	NA
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$400731	NA	$92476	NA	$400731	NA	$400731	NA	$400731	NA
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$26074	NA	$26074	NA	$260741	NA	$26074	NA	$26074	NA
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0	NA	$0	NA	$0	NA	$0	NA	$0	NA
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$327251	NA	$327251	NA	$327251	NA	$327251	NA	$327251	NA
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$1020094	NA	$1151890	NA	$1694811	NA	$1297854	NA	$1460145	NA
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1346524	NA	$1520495	NA	$2237151	NA	$1713167	NA	$1927391	NA
CAPITAL RECOVERY FACTOR	NONE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ANNUALIZED COST OF CAPITAL	$/YR	$171682	NA	$193863	NA	$285237	NA	$218429	NA	$245742	NA
TOTAL ANNUAL O&M COST	$/YR	$1046058	$951482	$1054060	$951482	$1087026	$951482	$1083277	$951482	$1072777	$951482
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$1217739	$951482	$1247923	$951482	$1372263	$951482	$1301706	$951482	$1318520	$951482
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$5.09	$3.02	$5.22	$3.02	$5.74	$3.02	$5.44	$3.02	$5.51	$3.02
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-1.89	NA	-1.72	NA	-1.28	NA	-1.66	NA	-1.43	NA
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.37	$3.02	$4.41	$3.02	$4.54	$3.02	$4.53	$3.02	$4.49	$3.02
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA
TONS PER YEAR RDF REQUIRED	TPY	10177	NA	10177	NA	10177	NA	10177	NA	10177	NA

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Summary of Out 4 data

variable definition	UNITS	Modification 10 & 11 Type I SIR W/disposal credit		Cumulative changes RDF @ $2/T	
		RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONA FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.07E+07	5.07E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	7.97E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	4.70E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.3E+08	2.3E+08	2.25E+08
DERATE	NONE	0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.80E+07	6.18E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.16		2.14	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2769	4196	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	777	277	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.42	0.29	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	-415	-98	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	-3.92	-1.07	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	4.69	1.28	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	63091	52764	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	14020	11725	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	69398	56682	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	21893	17334	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	2	2	1	1
NEW EMISSION CONATOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0

program mods

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Summary of Out 4 data

variable definition	UNITS	Modification 10 & 11 Type I SIR W/disposal credit RDF COFIRING	CONVENTIONAL FUEL	Cumulative changes RDF @ $2/T RDF COFIRING	CONVENTIONA FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.76	$1.47	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.55	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.92	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1170	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$76	$115	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$54		$4	
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	4717	6224	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$88,660		$32,809	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	2.390E+11	3.2E+11	3.2E+11	4.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$57,711	$9,138	$73,041	$12,225
ANNUAL CONVENTIONAL FUEL COST	$/YR	$357,931	$715,567	$473,769	$957,346
ANNUAL RDF FUEL COST	$/YR	$254,421		$26,941	
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	$94,000		$94,000	
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	4.69		8.11	
INCLUDED IN CAPITAL COST					
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$543,797		$106,769	

program mods

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Summary Worksheet

Summary of Out * data

variable definition	UNITS	Modification 10 & 11 Type I SIR w/disposal credit		Cumulative changes RDF @ $2/T	
		RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONA FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$162,291		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$400,731		$95,391	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$26,074		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$327,251		$338,165	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$1,460,145		$540,326	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1,927,391		$713,230	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$1,072,777	$951,482	$920,615	$1,196,348
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$951,482	$0	$1,196,348
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$3.02	$0.00	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-1.74		-0.19	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4	$3	$3	$3
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	10177		$13,470	
Avoided MSW disposal cost		$17,000		$17,000	
SIR with disposal credit		-1.66		0.04	

program mods

Summary of Out 4 data

variable definition	UNITS	Cumulative Changes RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.98E+07	NA
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08
DERATE	NONE	0.00	NA
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.14	NA
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.00
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0

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Summary of Out 4 data		Cumulative Changes	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314056	$226777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$58	NA
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$49333	NA
AVAILABILITY, FRACTION	NONE	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.20E+11	4.22E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$73041	$12226
ANNUAL CONVENTIONAL FUEL COST	$/YR	473769	957346
ANNUAL RDF FUEL COST	$/YR	$363701	NA
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	NA	$94000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	NA
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	8.11	NA
INCLUDED IN CAPITAL COST			
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$106769	NA

Summary of Out 4 data

variable definition	UNITS	Cumulative Changes RDF COFIRING	CONVENTIONAL FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0	NA
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0	NA
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95391	NA
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$272138	NA
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0	NA
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$338165	NA
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$812464	NA
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1072452	NA
CAPITAL RECOVERY FACTOR	NONE	0.13	0.13
ANNUALIZED COST OF CAPITAL	$/YR	$136738	NA
TOTAL ANNUAL O&M COST	$/YR	$1273899	$1196349
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$1410637	$1196349
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$4.41	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.69	NA
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$3.98	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00	NA
TONS PER YEAR RDF REQUIRED	TPY	13470	NA

Summary of Out 4 data

variable definition	UNITS	Modification #8-1 $0/T RDF plus $2/T delivery		Cumulative Changes (1: $0 +$2/T RDF cost)		Modification #8-2 $30.31/t RDF cost (same $/btu as coal)		Cumulative changes (2:RDF cost equal to coal $/btu)	
		RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.07E+07	5.07E+07	5.09E+07	5.09E+07	5.07E+07	5.07E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	7.97E+07	7.47E+07	8.67E+07	7.47E+07	7.97E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	4.70E+07	NA	1.98E+07	NA	4.70E+07	NA	1.98E+07	NA
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.76	0.82	0.75	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0.00	NA	0.00	NA	0.00	NA	0.00	NA
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.80E+07	6.18E+07	6.75E+07	6.20E+07	6.80E+07	6.18E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.16	NA	2.14	NA	2.16	NA	2.14	NA
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2769	4196	2749	4210	2769	4196	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	777	277	774	278	777	277	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.23	0.09	0.23	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.42	0.29	0.42	0.29	0.42	0.29	0.42	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	-415	-98	1	0	-415	-98	1	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	-3.92	-1.07	0.01	0.00	-3.92	-1.07	0.01	0.00
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	4.69	1.28	4.69	1.28	4.69	1.28	4.69	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	63091	52764	57618	52944	63091	52764	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	14020	11725	12804	11765	14020	11725	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	69398	56682	63875	56876	69398	56682	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	21893	17334	20019	23192	21893	17334	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	2	2	1	1	2	2	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0

Summary of Data		Modification 88-1		Cumulative		Modification 88-2		Cumulative changes	
		$0/T RDF plus		Changes		$30.31/t RDF cost		(2:RDF cost equal	
variable		$2/T delivery		(1: $0 +$2/T RDF cost)		(same $/btu as coal)		to coal $/btu)	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.76	$1.47	$1.60	$1.47	$1.76	$1.47	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.55	$0.00	$3.13	$0.00	$3.55	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.92	$0.00	$6.88	$0.00	$6.92	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1170	409	1257	409	1170	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$76	$115	$75	$115	$76	$115	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$4	NA	$4	NA	$65	NA	$65	NA
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	4717	6224	6290	8299	4717	6224	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$78806	NA	$49333	NA	$78806	NA	$49333	NA
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	2.39E+11	3.16E+11	3.20E+11	4.22E+11	2.39E+11	3.16E+11	3.20E+11	4.22E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$57711	$9138	$73041	$12225	$57711	$9138	$73041	$12226
ANNUAL CONVENTIONAL FUEL COST	$/YR	357931	715567	473769	957346	357931	715567	473769	957346
ANNUAL RDF FUEL COST	$/YR	$20354	NA	$26941	NA	$308460	NA	$408288	NA
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	NA	$94000	NA	$94000	NA	$94000	NA	$94000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	NA	0	NA	0	NA	0	NA
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	4.69	NA	4.69	NA	4.69	NA	4.69	NA
INCLUDED IN CAPITAL COST									
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$543797	NA	$106769	NA	$543797	NA	$106769	NA

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Summary of Out 4 data		Modification #8-1		Cumulative		Modification #8-2		Cumulative changes	
		$0/T RDF plus		Changes		$30.31/t RDF cost		(2:RDF cost equal	
variable		$2/T delivery		(1: $0 +$2/T RDF cost)		(same $/btu as coal)		to coal $/btu)	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$400731	NA	$95391	NA	$400731	NA	$95391	NA
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$26074	NA	$272138	NA	$26074	NA	$272138	NA
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$327251	NA	$338165	NA	$327251	NA	$338165	NA
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$1297854	NA	$812464	NA	$1297854	NA	$812464	NA
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1713167	NA	$1072452	NA	$1713167	NA	$1072452	NA
CAPITAL RECOVERY FACTOR	NONE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ANNUALIZED COST OF CAPITAL	$/YR	$218429	NA	$136738	NA	$218429	NA	$136738	NA
TOTAL ANNUAL O&M COST	$/YR	$828856	$951482	$937140	$1196348	$1116962	$951482	$1318486	$1196349
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$1047285	$951482	$1073877	$1196348	$1335391	$951482	$1455224	$1196349
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$4.38	$3.02	$3.36	$2.83	$5.58	$3.02	$4.55	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.49	NA	-0.22	NA	-1.81	NA	-3.01	NA
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$3.67	$3.02	$2.93	$2.83	$4.67	$3.02	$4.12	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA
TONS PER YEAR RDF REQUIRED	TPY	10177	NA	13470	NA	10177	NA	13470	NA
					800				800

Summary of Out & data		Modification #8-1		Cumulative		Modification #8-2		Cumulative changes	
		$0/T RDF plus		Changes		$30.31/t RDF cost		(2:RDF cost equal	
variable		$2/T delivery		(1: $0 +$2/T RDF cost)		(same $/btu as coal)		to coal $/btu)	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.07E+07	5.07E+07	5.09E+07	5.09E+07	5.07E+07	5.07E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	7.97E+07	7.47E+07	8.67E+07	7.47E+07	7.97E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	4.70E+07	NA	1.98E+07	NA	4.70E+07	NA	1.98E+07	NA
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.76	0.82	0.75	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0.00	NA	0.00	NA	0.00	NA	0.00	NA
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.80E+07	6.18E+07	6.75E+07	6.20E+07	6.80E+07	6.18E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.16	NA	2.14	NA	2.16	NA	2.14	NA
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2769	4196	2749	4210	2769	4196	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	777	277	774	278	777	277	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.23	0.09	0.23	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.42	0.29	0.42	0.29	0.42	0.29	0.42	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	-415	-98	1	0	-415	-98	1	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	-3.92	-1.07	0.01	0.00	-3.92	-1.07	0.01	0.00
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	4.69	1.28	4.69	1.28	4.69	1.28	4.69	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	63091	52764	57618	52944	63091	52764	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	14020	11725	12804	11765	14020	11725	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	69398	56682	63875	56876	69398	56682	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	21893	17334	20019	23192	21893	17334	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	2	2	1	1	2	2	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0

Summary of Out * data		Modification #8-1		Cumulative		Modification #8-2		Cumulative changes	
		$0/T RDF plus		Changes		$30.31/t RDF cost		(2:RDF cost equal	
variable		$2/T delivery		(1: $0 +$2/T RDF cost:		(same $/btu as coal.)		to coal $/btu)	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.76	$1.47	$1.60	$1.47	$1.76	$1.47	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.55	$0.00	$3.13	$0.00	$3.55	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.92	$0.00	$6.88	$0.00	$6.92	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1170	409	1257	409	1170	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314056	$226777	$314056	$226777	$314056	$226777	$314056	$226777
OPERATORS PER SHIFT	MAN/SHIFT	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$76	$115	$75	$115	$76	$115	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$4	NA	$4	NA	$65	NA	$65	NA
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	4717	6224	6290	8299	4717	6224	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$78806	NA	$49333	NA	$78806	NA	$49333	NA
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	2.39E+11	3.16E+11	3.20E+11	4.22E+11	2.39E+11	3.16E+11	3.20E+11	4.22E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$57711	$9138	$73041	$12225	$57711	$9138	$73041	$12226
ANNUAL CONVENTIONAL FUEL COST	$/YR	357931	715567	473769	957346	357931	715567	473769	957346
ANNUAL RDF FUEL COST	$/YR	$20354	NA	$26941	NA	$308460	NA	$408288	NA
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	NA	$94000	NA	$94000	NA	$94000	NA	$94000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	NA	0	NA	0	NA	0	NA
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	4.69	NA	4.69	NA	4.69	NA	4.69	NA
INCLUDED IN CAPITAL COST									
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$543797	NA	$106769	NA	$543797	NA	$106769	NA

Summary of Out 4 data		Modification #8-1		Cumulative		Modification #8-2		Cumulative changes	
		$0/T RDF plus		Changes		$30.31/t RDF cost		(2:RDF cost equal	
variable		$2/T delivery		(1: $0 +$2/T RDF cost)		(same $/btu as coal)		to coal $/btu)	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONAL FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$400731	NA	$95391	NA	$400731	NA	$95391	NA
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$26074	NA	$272138	NA	$26074	NA	$272138	NA
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0	NA	$0	NA	$0	NA	$0	NA
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$327251	NA	$338165	NA	$327251	NA	$338165	NA
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$1297854	NA	$812464	NA	$1297854	NA	$812464	NA
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1713167	NA	$1072452	NA	$1713167	NA	$1072452	NA
CAPITAL RECOVERY FACTOR	NONE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ANNUALIZED COST OF CAPITAL	$/YR	$218429	NA	$136738	NA	$218429	NA	$136738	NA
TOTAL ANNUAL O&M COST	$/YR	$828856	$951482	$937140	$1196348	$1116962	$951482	$1318486	$1196349
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$1047285	$951482	$1073877	$1196348	$1335391	$951482	$1455224	$1196349
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$4.38	$3.02	$3.36	$2.83	$5.58	$3.02	$4.55	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.49	NA	-0.22	NA	-1.81	NA	-3.01	NA
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$3.47	$3.02	$2.93	$2.83	$4.67	$3.02	$4.12	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00	NA	$0.00	NA	$0.00	NA	$0.00	NA
TONS PER YEAR RDF REQUIRED	TPY	10177	NA	13470	NA	10177	NA	13470	NA
					800				800

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Summary of Out 4 data		Modification 12		Modification 12	
		Puget Sound		Puget Sound	
variable		W/Stack Temperature		W/Boiler exit temp.	
definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONA FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.87E+07	6.87E+07	6.82E+07	6.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.55E+08	1.50E+08	1.42E+08	1.38E+08
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.50E+07		3.20E+07	
BOILER EFFICIENCY AT MCR	NONE	0.84	0.87	0.77	0.8
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.74	0.87	0.68	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	9.24E+07	7.91E+07	9.99E+07	8.51E+07
RDF FLOWRATE, AVERAGE	TPH	2.93		3.17	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	5281	7531	5709	8107
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1859	748	1949	805
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.49	0.3	0.47	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.46	0.37	2.26	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	33.49	3.43	30.71	3.43
COMBUSTION AIR RATE, AVERAGE	LB/HR	87711	75044	94819	80778
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	19491	16676	21071	17951
WET FLUE GAS RATE, AVERAGE	LB/HR	97001	81827	104924	88080
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	10526	20415	17437	30981
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0

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Summary of Out 4 data		Modification 12 Puget Sound W/Stack Temperature		Modification 12 Puget Sound W/Coiler exit temp.	
variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL	RDF COFIRING	CONVENTIONA FUEL
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.04	$0.89	$1.12	$0.95
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.39	$0.00	$1.63	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$3.82	$0.00	$4.08	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2520	1635	2520	1635
ANNUAL LABOR COST, BURDENED	$/YR	$478,870	$345,788	$457,072	$330,048
OPERATORS PER SHIFT	MAN/SHIFT	3.22	2.33	3.08	2.22
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$206	$294	$223	$316
RDF FUEL COST, AVERAGE	$/HR	$6.00		$6.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$14.87	$5.98	$15.59	$6.44
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8561	6290	8561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$40,580		$40,030	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.320E+11	5.880E+11	4.290E+11	5.840E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$39,255	$7,585	$42,934	$8,164
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,295,562	$2,514,574	$1,400,561	$2,706,711
ANNUAL RDF FUEL COST	$/YR	$36,911		$39,902	
ANNUAL ASH DISPOSAL COST	$/YR	$93,548	$51,234	$98,056	$55,149
ANNUAL MSW DISPOSAL COST	$/YR	$672,000		$672,000	
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	33.49		30.71	
INCLUDED IN CAPITAL COST					
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$133,007		$134,675	

program mods

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Summary of Out 4 data

variable definition	UNITS	Modification 12 Puget Sound W/Stack Temperature RDF COFIRING	CONVENTIONAL FUEL	Modification 12 Puget Sound W/Boiler exit temp. RDF COFIRING	CONVENTIONA FUEL
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$116,724		$114,483	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$418,582		$410,093	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$668,313		$659,252	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$882,173		$870,212	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$1,984,725	$2,919,181	$2,078,555	$3,100,072
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$2,919,181	$0	$3,100,072
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0	$5	$0	$5
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	1.73		2.18	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.60	$4.97	$4.85	$5.31
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	18,455		19,951	
Avoided MSW disposal cost		$210,000		$210,000	
SIR with disposal credit		4		4.48	

program mods

APPENDIX D

NCEL RDF COST MODEL: MULTIPLAN® FORMULA LISTINGS

RDFMDLIN

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      1                    2                    3
 1  1        "PORT HUENEME ALGORITHM.
               REVISED AND SIMPLIFIED 12
               /01/84"
 2  2                                      "MODIFIED JANUARY 1
                                           986"
 3  3        "Facility:"
 4  4
 5  5        "SUMMER STEAM DEMANDS:"
 6  6                                      "AVERAGE HOURLY BTU
                                            INPUT IN THESE MAT
                                           RICES"
 7  7
 8  8                                      "MON-FRI"
 9  9                                      "SAT"
10 10                                      "SUN"
11 11        "WINTER STEAM DEMANDS:"
12 12                                      "AVERAGE HOURLY BTU
                                            STEAM"
13 13
14 14                                      "MON-FRI"
15 15                                      "SAT"
16 16                                      "SUN"
17 17        "SPRING AND FALL STEAM DE
               MANDS:"
18 18                                      "AVERAGE HOURLY BTU
                                           "
19 19
20 20                                      "MON-FRI"
21 21                                      "SAT"
22 22                                      "SUN"
23 23
24 24        "CURRENT BOILER OPERATING
               CONDITIONS"
25 25        "Boiler availability"
26 26        "Excess air required at M
               CR"
27 27        "Total heat release at MC
               R"
28 28        "Fuel temperature at boil
               er boundary"
29 29        "Radiation losses"
30 30        "Carbon losses"
31 31        "Air temperature at FD or
               airheater inlet"
32 32        "Preheated combustion air
               temperature"
33 33        "Ash temperature at boile
               r boundary"
34 34        "Gas temperature at boile
               r/economizer exit"
35 35        "Particulate emissions ra
               te"
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1		2	3
36	36	"Applicable particulate emissions standard"	
37	37	"Ash handling system capacity"	
38	38	"CONVENTIONAL FUEL CHARACTERISTICS: AS RECEIVED"	
39	39	"Moisture"	
40	40	"Ash"	
41	41	"Hydrogen"	
42	42	"Higher heating value"	
43	43	"Specific heat"	
44	44	"RDF CHARACTERISTICS : AS RECEIVED"	
45	45	"Moisture"	
46	46	"Ash"	
47	47	"Hydrogen"	
48	48	"Moisture-ash-free heating value"	
49	49	"Bulk density"	
50	50	"Size (passes through screen opening)"	
51	51	"Cofire ratio"	"(based on heating value)"
52	52	"Days of storage desired"	
53	53	"Length of mechanical transfer conveyor"	
54	54	"Fuel temperature at boiler boundary"	
55	55	"ECONOMIC FACTORS"	
56	56	"Financial life of project"	
57	57	"Discount factor"	
58	58	"Cost of electricity"	
59	59	"Ash disposal cost"	
60	60	"Operator wage rate, unburdened"	
61	61	"Burdening rate (a multiplier)"	
62	62	"Annual quantity of MSW generated on base"	
63	63	"MSW disposal cost: tipping fee"	
64	64	" transportation"	
65	65	"Conventional fuel cost, delivered"	
66	66	"RDF cost, delivered"	
67	67	"IF THE FOLLOWING STATEMENTS ARE TRUE, ENTER 1 :"	
68	68		
69	69	"BOILER HAS SOOT BLOWERS FOR THE CONVECTIVE"	

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        1                    2                    3
70 70       "BOILER HAS SOOT BLOWERS
            FOR THE ECONOMIZER"
71 71       "BOILER HAS AN ECONOMIZER
            "
72 72       "ECONOMIZER IF PRESENT IS
             BARE TUBE"
73 73       "Boiler has a history of
            slagging"
74 74       "ADEQUATE BACKUP CAPABILI
            TY EXISTS"
75 75       "BOILER IS EQUIPPED WITH
            A BAGHOUSE"
76 76       "BOILER IS EQUIPPED WITH
            AN ESP"
77 77       "BOILER IS EQUPIIED WITH
            A VENTURI SCRUBBER"
78 78       "BOILER HAS MULTICLONES O
            R CYCLONES"
79 79       "BOILER WAS ORIGINALLY DE
            SIGNED FOR COAL"
80 80       "BOILER HAS MOVING OR DUM
            PING GRATE"
81 81       "BOILER HAS AN ASH HANDLI
            NG SYSTEM"
82 82       "THE CF ASSUMED COFIRED I
            S OIL"
83 83       "THE CF ASSUMED COFIRED I
            S COAL"
84 84       "THE CF ASSUMED COFIRED I
            S GAS"
85 85       "THE FURNACE IS PC OR CYC
            LONE TYPE"
86 86       "The boiler has an ID fan
            "
87 87       "ALTERNATIVE SOLID FUEL I
            S NOT RDF BUT COAL"
88 88       "ALTERNATIVE SOLID FUEL I
            S RDF-3"
89 89       "ALTERNATIVE SOLID FUEL I
            S RDF-5 (d-RDF)"
90 90
91 91
92 92
93 93       "ADDITIONAL INPUT REGARDI
            NG ORIGINAL BOILER DESIGN
             FOLLOWS:"
94 94
95 95       "FRACTIONAL MOISTURE OF A
            S RCVD DESIGN CF"
96 96       "FRACTIONAL ASH CONTENT O
            F AS RCVD DCF"
97 97       "FRACTIONAL EXCESS AIR RE
            QD FOR DCF AT MCR"
```

1		2	3
98	98	"TOTAL FUEL VALUE TO BOILER AT MCR"	
99	99	" NAMEPLATE WITH DCF"	
100	100	"HIGHER HEATING VALUE OF DCF"	
101	101	"FRACTION OF HHVCFD LOST DUE TO CARBON LOSS"	
102	102	"DESIGN FUEL SPECIFIC HEAT"	
103	103	"TEMPERATURE OF DCF AT BOILER BOUNDARY"	
104	104	"HYDROGEN MASS FRACTION OF AS-RCVD CFD"	
105	105	"RADIATION LOSSES AS A FRACTION OF DTOTHHVCF"	
106	106		
107	107		
108	108		
109	109		
110	110		
111	111		
112	112		
113	113		
114	114	"IF THE ALTERNATIVE SOLID FUEL BEING FIRED IS WOOD (HOG FUEL OR"	
115	115	"WHOLE TREE CHIPS) THE RDF EXPRESSIONS ARE REASONABLE. SIMPLY"	
116	116	"SUBSTITUTE THE WOOD MOISTURE, ASH, PARTICLE SIZE, AND BULK"	
117	117	"DENSITY INTO THE RDF VARIABLES. HOWEVER, IF THE ASF BEING FIRED"	
118	118	"IS COAL, SUBSTITUTE THE COAL HHV FOR RDF HHV (HHV RDF), AND "	
119	119	"ALSO ENTER OTHER SOLIDS CHARACTERISTICS APPROPRIATELY."	

```
        4                    5                    6
 1
 2
 3
 4 "INPUTS(LINES 3 TO
   105):"
 5
 6
 7                      "SHIFT 1"            "SHIFT 2"
 8                      50000000             45000000
 9                      40000000             40000000
10                      40000000             40000000
11
12
13                      "SHIFT 1"            "SHIFT 2"
14                      150000000            140000000
15                      130000000            130000000
16                      130000000            130000000
17
18
19                      "SHIFT 1"            "SHIFT 2"
20                      100000000            92500000
21                      85000000             85000000
22                      85000000             85000000
23
24                                           "INPUT IN THIS COLU
                                             MN"
25                                           0.98
26                                           0.3
27                                           172840000
28                                           70
29                                           0.0041
30                                           0.0405
31                                           70
32                                           70
33                                           450
34                                           340
35                                           0.02
```

	4	5	6
36			0.11
37			15
38			
39			0.12
40			0.07
41			0.04
42			10500
43			0.3
44			
45			0.2
46			0.1
47			0.07
48			9000
49			35
50			1.5
51			0.4
52			1
53			0
54			70
55			
56			25
57			9.54
58			0.0227
59			16
60			13.68
61			1.305
62			42000
63			10
64			6
65			78
66			2
67			
68			
69			1

	4	5	6
70			1
71			1
72			1
73			0
74			1
75			1
76			0
77			1
78			0
79			1
80			1
81			1
82			0
83			1
84			0
85			0
86			1
87			0
88			0
89			1
90			
91			
92			
93			
94			
95			0.1548
96			0.0913
97			0.3

4	5	6
98		
99		172840000
100		10290
101		0.0405
102		0.3
103		80
104		0.0405
105		0.0041
106		
107		
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	7	8	9
1			R99C6
2			R100C6
3			R95C6
4			R96C6
5			R97C6
6			R101C6
7	"SHIFT 3"		R102C6
8	45000000		R103C6
9	40000000		R104C6
10	40000000		R105C6
11			R27C6
12			+R42C6
13	"SHIFT 3"		+R39C6
14	135000000		+R40C6
15	130000000		+R26C6
16	130000000		+R30C6
17			+R43C6
18			+R28C6
19	"SHIFT 3"		+R41C6
20	90000000		+R29C6
21	85000000		+R51C6
22	85000000		+R47C6
23			+R45C6
24			+R46C6
25	"Fraction"		+R50C6
26	"Fraction"		+R49C6
27	"Btu/hr"		+R66C6
28	"Deg F"		+R54C6
29	"Fraction"		+R34C6
30	"Fraction"		+R31C6
31	"Deg F"		+R32C6
32	"Deg F"		+R33C6
33	"Deg F"		+R58C6
34	"Deg F"		+R65C6/2000
35	"lb/mmBtu"		+R59C6

	7	8	9
36	"lb/mmBtu"		+R52C6
37	"TPH"		+R53C6
38			+R56C6
39	"Fraction"		+R57C6
40	"Fraction"		+R60C6
41	"Fraction"		+R25C6
42	"Btu/lb"		+R36C6
43	"Btu/lb/deg F"		R62C6
44			+R61C6
45	"Fraction"		+R63C6
46	"Fraction"		+R48C6
47	"Fraction"		R69C6
48	"Btu/lb"		R70C6
49	"lb/cf"		R71C6
50	"Inches"		R72C6
51	"Fraction"		R73C6
52	"days"		R74C6
53	"Miles"		R75C6
54	"Deg F"		R76C6
55			R77C6
56	"Years"		R78C6
57			R79C6
58	"$/kWh"		R80C6
59	"$/ton"		R81C6
60	"$/hr"		R82C6
61			R83C6
62	"Tons/yr"		R84C6
63	"$/ton"		R85C6
64	"$/ton"		R86C6
65	"$/ton"	0.039*2000	R87C6
66	"$/ton"		R88C6
67			R89C6
68			R90C6
69			R8C5

	7	8	9
70			R8C6
71			R8C7
72			R9C5
73			R9C6
74			R9C7
75			R10C5
76			R10C6
77			R10C7
78			R14C5
79			R14C6
80			R14C7
81			R15C5
82			R15C6
83			R15C7
84			R16C5
85			R16C6
86			R16C7
87			R20C5
88			R20C6
89			R20C7
90			R21C5
91			R21C6
92			R21C7
93			R22C5
94			R22C6
95	"Fraction"		R22C7
96	"Fraction"		R37C6*2000
97	"Fraction"		+R35C6

```
                7                       8                       9
98                                                  +R64C6

 99 "BTUH"
100 "BTU/LB"

101 "Fraction"

102 "BTU/LB/DEG F"

103 "DEG F"

104 "Fraction"

105 "Fraction"

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          10
 1 "DTOTHHVCF"


 2 "HHVCFD"

 3 "MCFD"
 4 "ACFD"

 5 "EACFD"
 6 "XCLOSD"


 7 "CPCFD"
 8 "TCFD"
 9 "XHCFD"
10 "LOSRADD"
11 "TOTHHVCF"
12 "HHVCF"

13 "MCF"
14 "ACF"
15 "EACF"
16 "XCLOS"
17 "CPCF"

18 "TCF"

19 "XHCF"
20 "LOSRAD"
21 "X"
22 "XHRDF"
23 "MRDF"
24 "ARDF"

25 "DP"
26 "RHDRDF"

27 "RDFCST"

28 "TRDF"

29 "TSTK"
30 "TAIR"
31 "TCAPH"

32 "TASH"

33 "ELCOST"

34 "CFCOST"

35 "DISPCOST"
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            10
36 "STORTIME"

37 "MILES"

38 "LIFE"

39 "INTEREST"
40 "WAGE"
41 "AVAILCF"
42 "TSPSTD"
43 "MSWPROD"
44 "WGBURDON"

45 "DISPMSW"
46 "MAF HHV"
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96 "ash capacity"

97 "emissions"

```
            10
 98 "transport"

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102

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WORK 1

	1	2	3
1	[rdfmdlin xferdata]	R24C2*(1-R3C1-R4C1)	R53C2*R26C3
2	[rdfmdlin xferdata]	R24C2*R4C1	R54C2*R26C3
3	[rdfmdlin xferdata]	R24C2*R3C1	R55C2*R26C3
4	[rdfmdlin xferdata]	R26C2	R56C2*R26C3
5	[rdfmdlin xferdata]	SUM(R1:4C2)	R57C2*R26C3
6	[rdfmdlin xferdata]	R1C2*R7C1*(R8C1-32)	SUM(R1:5C3)
7	[rdfmdlin xferdata]	R1C1	R59C2*R26C3
8	[rdfmdlin xferdata]	R24C2*R3C1*(R8C1-32)	R60C2*R26C3
9	[rdfmdlin xferdata]	R4C2*0.24*(R30C1-32)	R61C2*R26C3
10	[rdfmdlin xferdata]	SUM(R6:9C2)	R62C2*R26C3
11	[rdfmdlin xferdata]	R2C2	R63C2*R26C3
12	[rdfmdlin xferdata]	R5C2-R11C2-R13C2-R14C2	R64C2*R26C3
13	[rdfmdlin xferdata]	R24C2*(R3C1+(R9C1*9))	SUM(R7:12C3)
14	[rdfmdlin xferdata]	IF(R6C1=0,R103C1*R1C1/14500,R6C1*R1C1/14500)	R66C2*R26C3
15	[rdfmdlin xferdata]	SUM(R11:14C2)	R6C3-R14C3-R16C3-R17C3
16	[rdfmdlin xferdata]	R11C2*0.2*(R32C1-32)	R68C2*R26C3
17	[rdfmdlin xferdata]	R12C2*0.25*(R29C1-32)	((1-R21C1)*R11C1*R25C3*R28C3/R113C2+R21C1*R11C1*R25C3*R29C3/R113C2)/14500
18	[rdfmdlin xferdata]	R13C2*(1128+(0.455*(R29C1-160)))	SUM(R14:17C3)
19	[rdfmdlin xferdata]	R14C2*14500	R71C2*R26C3
20	[rdfmdlin xferdata]	(R10C1+0.016)*R1C1	R15C3*0.25*(R29C1-32)
21	[rdfmdlin xferdata]	SUM(R16:20C2)	R73C2*R26C3
22	[rdfmdlin xferdata]	R10C2-R21C2	R17C3*14500
23	[rdfmdlin xferdata]	R22C2/R7C2	R75C2*R26C3
24	[rdfmdlin xferdata]	R1C1/R2C1	SUM(R19:23C3)
25	[rdfmdlin xferdata]	R12C2/1.2792+R13C2/0.78	1.105*R25C2
26	[rdfmdlin xferdata]	0.00073*R1C1*(1+R5C1)	R25C3/R113C2
27	[rdfmdlin xferdata]	R50C2*(1-R13C1-R14C1)	((R1C1-(R25C3/R113C2)*R11C1)/R1C1)*100
28	[rdfmdlin xferdata]	R50C2*R14C1	IF(AND(R63C1=0,R56C1=0),0.02*(1.105)^2,0)
29	[rdfmdlin xferdata]	R50C2*R13C1	IF(R27C3)=0,((R25C1/0.75)^0.41*0.05+(R27C3/20)^2.58*0.01)*(1.105)^2,((R25C1/0.75)^0.41*0.05)*(1.105)^2)
30	[rdfmdlin xferdata]	R52C2	R13C3-R24C3

	1	2	3
31	[rdfmdlin xferdata]	SUM(R27:30C2)	R30C3/(R8C3+R10C3)
32	[rdfmdlin xferdata]	R27C2*R17C1*(R18C1-32)	R53C2*R57C3
33	[rdfmdlin xferdata]	R11C1	R54C2*R57C3
34	[rdfmdlin xferdata]	R50C2*R13C1*(R18C1-32)	R55C2*R57C3
35	[rdfmdlin xferdata]	R30C2*0.24*(R30C1-32)	R56C2*R57C3
36	[rdfmdlin xferdata]	SUM(R32:35C2)	R57C2*R57C3
37	[rdfmdlin xferdata]	R28C2	SUM(R32:36C3)
38	[rdfmdlin xferdata]	R31C2-R37C2-R39C2-R40C2	R59C2*R57C3
39	[rdfmdlin xferdata]	R50C2*(R13C1+(R19C1*9))	R60C2*R57C3
40	[rdfmdlin xferdata]	IF(R16C1=0,R103C1*R11C1/14500,R16C1*R1C1/14500)	R61C2*R57C3
41	[rdfmdlin xferdata]	SUM(R37:40C2)	R62C2*R57C3
42	[rdfmdlin xferdata]	R37C2*0.2*(R32C1-32)	R63C2*R57C3
43	[rdfmdlin xferdata]	R38C2*0.25*(R29C1-32)	R64C2*R57C3
44	[rdfmdlin xferdata]	R39C2*(1128+(0.455*(R29C1-160)))	SUM(R38:43C3)
45	[rdfmdlin xferdata]	R40C2*14500	R66C2*R57C3
46	[rdfmdlin xferdata]	(R20C1+0.016)*R11C1	R37C3-R45C3-R47C3-R48C3
47	[rdfmdlin xferdata]	SUM(R42:46C2)	R68C2*R57C3
48	[rdfmdlin xferdata]	R36C2-R47C2	(R57C3*(1-R21C1)*R1C1*R58C3+R57C3*R21C1*R11C1*R59C3)/14500
49	[rdfmdlin xferdata]	R48C2/R33C2	SUM(R45:48C3)
50	[rdfmdlin xferdata]	R11C1/R12C1	R71C2*R57C3
51	[rdfmdlin xferdata]	R38C2/1.2792+R39C2/0.78	R46C3*0.25*(R29C1-32)
52	[rdfmdlin xferdata]	0.00073*R11C1*(1+R15C1)	R73C2*R57C3
53	[rdfmdlin xferdata]	R78C2*(1-R13C1-R14C1)	R48C3*14500
54	[rdfmdlin xferdata]	R77C2*(1-R23C1-R24C1)	R75C2*R57C3
55	[rdfmdlin xferdata]	R78C2*R14C1+R77C2*R24C1	SUM(R50:54C3)
56	[rdfmdlin xferdata]	R78C2*R13C1+R77C2*R23C1	R113C2*R57C3
57	[rdfmdlin xferdata]	R11C1*R21C1*0.00073*(1+R80C2)+R11C1*(1-R21C1)*0.00073*(1+R15C1)	IF(R67C1=1,0.25,0.6)*R1C1/R11C1
58	[rdfmdlin xferdata]	SUM(R53:57C2)	R103C1

	1	2	3
59	[rdfmdlin xferdata]	R53C2*R17C1*(R18C1-32)	(R25C1/0.75)^0.41*0.05+(2)^2.58*0.01
60	[rdfmdlin xferdata]	(1-R21C1)*R11C1	R44C3-R55C3
61	[rdfmdlin xferdata]	R54C2*0.6*(R28C1-32)	R60C3/(R39C3+R41C3)
62	[rdfmdlin xferdata]	R21C1*R11C1	(IF(AND(R69C1<=R30C3,R69C1)=R60C3),R69C1,0)+IF(R69C1)R30C3,R30C3,0))
63	[rdfmdlin xferdata]	R78C2*R13C1*(R18C1-32)+R77C2*R23C1*(R28C1-32)	(IF(AND(R70C1<=R30C3,R70C1)=R60C3),R70C1,0)+IF(R70C1)R30C3,R30C3,0))
64	[rdfmdlin xferdata]	R57C2*0.24*(R30C1-32)	(IF(AND(R71C1<=R30C3,R71C1)=R60C3),R71C1,0)+IF(R71C1)R30C3,R30C3,0))
65	[rdfmdlin xferdata]	SUM(R59:64C2)	(IF(AND(R72C1<=R30C3,R72C1)=R60C3),R72C1,0)+IF(R72C1)R30C3,R30C3,0))
66	[rdfmdlin xferdata]	R55C2	(IF(AND(R73C1<=R30C3,R73C1)=R60C3),R73C1,0)+IF(R73C1)R30C3,R30C3,0))
67	[rdfmdlin xferdata]	R58C2-R66C2-R68C2-R69C2	(IF(AND(R74C1<=R30C3,R74C1)=R60C3),R74C1,0)+IF(R74C1)R30C3,R30C3,0))
68	[rdfmdlin xferdata]	9*((R19C1*R78C2)+R22C1*R77C2*(1-R23C1-R24C1))+R23C1*R77C2+R13C1*R78C2	(IF(AND(R75C1<=R30C3,R75C1)=R60C3),R75C1,0)+IF(R75C1)R30C3,R30C3,0))
69	[rdfmdlin xferdata]	(1-R21C1)*R40C2+0.05*R62C2/14500	(IF(AND(R76C1<=R30C3,R76C1)=R60C3),R76C1,0)+IF(R76C1)R30C3,R30C3,0))
70	[rdfmdlin xferdata]	SUM(R66:69C2)	(IF(AND(R77C1<=R30C3,R77C1)=R60C3),R77C1,0)+IF(R77C1)R30C3,R30C3,0))
71	[rdfmdlin xferdata]	R66C2*0.2*(R32C1-32)	(IF(AND(R78C1<=R30C3,R78C1)=R60C3),R78C1,0)+IF(R78C1)R30C3,R30C3,0))
72	[rdfmdlin xferdata]	R67C2*0.25*(R29C1-32)	(IF(AND(R79C1<=R30C3,R79C1)=R60C3),R79C1,0)+IF(R79C1)R30C3,R30C3,0))
73	[rdfmdlin xferdata]	R68C2*(1128+(0.455*(R29C1-160)))	(IF(AND(R80C1<=R30C3,R80C1)=R60C3),R80C1,0)+IF(R80C1)R30C3,R30C3,0))

	1	2	3
74	[rdfmdlin xferdata]	R69C2*14500	(IF(AND(R81C1(=R30C3,R81C1)=R60C3),R81C1,0)+IF(R81C1)R30C3,R30C3,0))
75	[rdfmdlin xferdata]	(R20C1+0.016)*R11C1	(IF(AND(R82C1(=R30C3,R82C1)=R60C3),R82C1,0)+IF(R82C1)R30C3,R30C3,0))
76	[rdfmdlin xferdata]	SUM(R71:75C2)	(IF(AND(R83C1(=R30C3,R83C1)=R60C3),R83C1,0)+IF(R83C1)R30C3,R30C3,0))
77	[rdfmdlin xferdata]	R21C1*R11C1/R79C2	(IF(AND(R84C1(=R30C3,R84C1)=R60C3),R84C1,0)+IF(R84C1)R30C3,R30C3,0))
78	[rdfmdlin xferdata]	(1-R21C1)*R11C1/R12C1	(IF(AND(R85C1(=R30C3,R85C1)=R60C3),R85C1,0)+IF(R85C1)R30C3,R30C3,0))
79	[rdfmdlin xferdata]	R46C1*(1-R23C1-R24C1)	(IF(AND(R86C1(=R30C3,R86C1)=R60C3),R86C1,0)+IF(R86C1)R30C3,R30C3,0))
80	[rdfmdlin xferdata]	IF(R67C1=1,R15C1,(R15C1+R23C1+0.5*R24C1-R13C1-0.5*R14C1+(R25C1/0.75)^0.67*0.05))	(IF(AND(R87C1(=R30C3,R87C1)=R60C3),R87C1,0)+IF(R87C1)R30C3,R30C3,0))
81	[rdfmdlin xferdata]	R65C2-R76C2	(IF(AND(R88C1(=R30C3,R88C1)=R60C3),R88C1,0)+IF(R88C1)R30C3,R30C3,0))
82	[rdfmdlin xferdata]	R81C2/R11C1	(IF(AND(R89C1(=R30C3,R89C1)=R60C3),R89C1,0)+IF(R89C1)R30C3,R30C3,0))
83	[rdfmdlin xferdata]	R67C2/1.2792+R68C2/0.78	(IF(AND(R90C1(=R30C3,R90C1)=R60C3),R90C1,0)+IF(R90C1)R30C3,R30C3,0))
84	[rdfmdlin xferdata]	((R1C1-R11C1)/R1C1)*100	(IF(AND(R91C1(=R30C3,R91C1)=R60C3),R91C1,0)+IF(R91C1)R30C3,R30C3,0))
85	[rdfmdlin xferdata]	R107C1	(IF(AND(R92C1(=R30C3,R92C1)=R60C3),R92C1,0)+IF(R92C1)R30C3,R30C3,0))
86	[rdfmdlin xferdata]	R112C1	(IF(AND(R93C1(=R30C3,R93C1)=R60C3),R93C1,0)+IF(R93C1)R30C3,R30C3,0))

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87	[rdfmdlin xferdata] R53C2		(IF(AND(R94C1(=R30C 3,R94C1)=R60C3),R94 C1,0)+IF(R94C1)R30C 3,R30C3,0))
88	[rdfmdlin xferdata] R54C2		(IF(AND(R95C1(=R30C 3,R95C1)=R60C3),R95 C1,0)+IF(R95C1)R30C 3,R30C3,0))
89	[rdfmdlin xferdata] R55C2		(520*SUM(R62:64C3,R 71:73C3,R80:82C3))+ (104*SUM(R65:70C3,R 74:79C3,R83:88C3))
90	[rdfmdlin xferdata] R56C2		R89C3/8760
91	[rdfmdlin xferdata] R57C2		SUM(R96:100C3)
92	[rdfmdlin xferdata] R58C2		IF(R91C3=0,0,R89C3/ R91C3)
93	[rdfmdlin xferdata] R59C2		
94	[rdfmdlin xferdata] R60C2		
95	[rdfmdlin xferdata] R61C2		
96	[rdfmdlin xferdata] R62C2		(IF(R62C3)0,520,0)) +(IF(R63C3)0,520,0))+(IF(R64C3)0,520,0))+(IF(R65C3)0,104, 0))+(IF(R66C3)0,104 ,0))+(IF(R67C3)0,10 4,0))
97	[rdfmdlin xferdata] R63C2		(IF(R68C3)0,104,0)) +(IF(R69C3)0,104,0)+(IF(R70C3)0,104,0))+(IF(R71C3)0,520, 0))+(IF(R72C3)0,520 ,0))+(IF(R73C3)0,52 0,0))
98	[rdfmdlin xferdata] R64C2		(IF(R74C3)0,104,0)) +(IF(R75C3)0,104,0))+(IF(R76C3)0,104,0))+(IF(R77C3)0,104, 0))+(IF(R78C3)0,104 ,0))+(IF(R79C3)0,10 4,0))
99		R65C2	(IF(R80C3)0,1040,0))+(IF(R81C3)0,1040, 0))+(IF(R82C3)0,104 0,0))+(IF(R83C3)0,2 08,0))+(IF(R84C3)0, 208,0))+(IF(R85C3)0 ,208,0))
100	IF(AND(R63C1=1,R56C 1=1),0.02,0)	R66C2	(IF(R86C3)0,208,0)) +(IF(R87C3)0,208,0))+(IF(R88C3)0,208,0))
101	IF(AND(R63C1=0,R56C 1=1),0.03,0)	R92C2-R100C2-R102C2 -R103C2	R92C3/R30C4

	1	2	3
102	IF(AND(R61C1=1,R56C1=0),0.04,0)	R68C2	R92C3/R48C2
103	SUM(R100:102C1)	(R107C1*R94C2+R112C1*R96C2)/14500	
104	R83C2/R25C2	SUM(R100:103C2)	R25C4/R25C2
105	IF(R104C1)1,(R104C1)^2,1)	R71C2	IF(R104C3)1,(R104C3)^2,1)
106	IF(AND(R104C1)1,R84C2(0,R100C1=0.02),2,1)	R101C2*0.25*(R29C1-32)	IF(AND(R104C3)1,R27C4(0,R100C1=0.02),2,1)
107	R103C1*R105C1*R106C1	R73C2	R103C1*R105C3*R106C3
108	IF(AND(R104C1(=1,R84C2)=0),(R25C1/0.75)^0.41*0.05+(R84C2/20)^2.58*0.01,0)	R103C2*14500	IF(AND(R104C3(=1,R27C4)=0),(R35C1/0.75)^0.41*0.05+(R27C4/20)^2.58*0.01,0)
109	IF(AND(R104C1(=1,R84C2(0),(R25C1/0.75)^0.41*0.05,0)	R75C2	IF(AND(R104C3(=1,R27C4(0),(R25C1/0.75)^0.41*0.05,0)
110	IF(AND(R104C1)1,R84C2)=0),((R25C1/0.75)^0.41*0.05+(R84C2/20)^2.58*0.01)*(R104C1)^2,0)	SUM(R105:109C2)	IF(AND(R104C3)1,R27C4)=0),((R25C1/0.75)^0.41*0.05+(R27C4/20)^2.58*0.01)*(R104C3)^2,0)
111	IF(AND(R104C1)1,R84C2(0),(R25C1/0.75)^0.41*0.05*(R104C1)^2,0)	R99C2-R110C2	IF(AND(R104C3)1,R27C4(0),(R25C1/0.75)^0.41*0.05*(R104C3)^2,0)
112	SUM(R108:111C1)	R111C2/R11C1	SUM(R108:111C3)
113		R101C2/1.2792+R102C2/0.78	

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 1 R53C2*R26C4
 2 R54C2*R26C4
 3 R55C2*R26C4
 4 R56C2*R26C4
 5 R57C2*R26C4
 6 SUM(R1:5C4)
 7 R59C2*R26C4
 8 R60C2*R26C4

 9 R61C2*R26C4

10 R62C2*R26C4
11 R63C2*R26C4
12 R64C2*R26C4

13 SUM(R7:12C4)

14 R66C2*R26C4


15 R6C4-R14C4-R16C4-R1
   7C4
16 R68C2*R26C4

17 (R10C4*R29C4+R8C4*R
   28C4)/14500


18 SUM(R14:17C4)

19 R71C2*R26C4
20 R15C4*0.25*(R29C1-3
   2)
21 R73C2*R26C4
22 R17C4*14500
23 R75C2*R26C4
24 SUM(R19:23C4)
25 R113C2*R26C4

26 R92C3/R111C2

27 ((R1C1-R11C1*R26C4)
   /R1C1)*100
28 R107C3


29 R112C3




30 R13C4-R24C4
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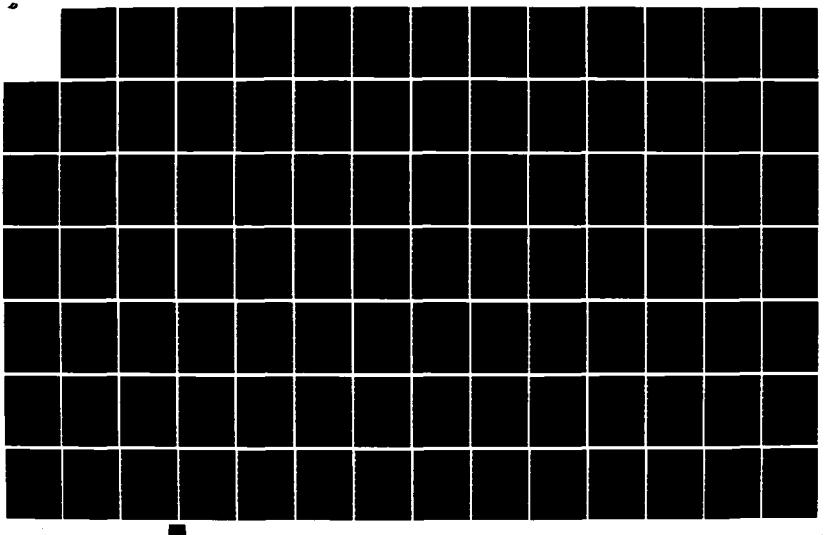
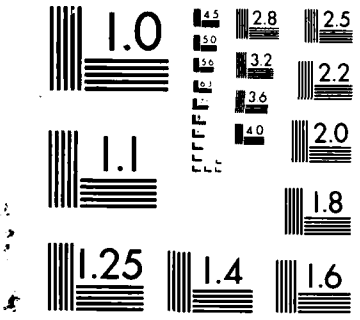
AD-A173 981 RDF (REFUSE-DERIVED FUEL) CO-FIRING COST/BENEFIT ANALYSIS USING THE NCEL R..(U) SYSTECH CORP XENIA OH H BELENCAN ET AL. AUG 86 NCEL-CR-86.012-VOL-2 2/3

UNCLASSIFIED N00123-83-D-0149 F/G 21/4 NL





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31 R1C4*R101C3
32 R2C4*R101C3

33 R3C4*R101C3
34 R4C4*R101C3

35 R5C4*R101C3

36 R6C4*R101C3
37 R7C4*R101C3
38 R8C4*R101C3

39 R9C4*R101C3

40 R10C4*R101C3


41 R11C4*R101C3
42 R12C4*R101C3

43 R13C4*R101C3

44 R14C4*R101C3

45 R15C4*R101C3
46 R16C4*R101C3

47 R17C4*R101C3
48 R18C4*R101C3



49 R19C4*R101C3
50 R20C4*R101C3
51 R21C4*R101C3

52 R22C4*R101C3

53 R23C4*R101C3

54 R24C4*R101C3

55 R25C4*R101C3

56 R43C4-R42C4+R35C4*0
   .24*R31C1
57 (R56C4-(1160*R46C4)
   +0.445*160*R46C4-R5
   2C4-R53C4)/(0.2*R44
   C4+0.25*R45C4+0.445
   *R46C4)
58 R43C4-R54C4
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4

59 R58C4/(R38C4+R40C4)

60 R27C2*R102C3

61 R28C2*R102C3

62 R29C2*R102C3

63 R30C2*R102C3

64 R31C2*R102C3

65 R32C2*R102C3

66 R33C2*R102C3

67 R34C2*R102C3

68 R35C2*R102C3

69 R36C2*R102C3

70 R37C2*R102C3

71 R38C2*R102C3

72 R39C2*R102C3

73 R40C2*R102C3

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                  4
74 R41C2*R102C3

75 R42C2*R102C3

76 R43C2*R102C3

77 R44C2*R102C3

78 R45C2*R102C3

79 R46C2*R102C3

80 R47C2*R102C3


81 R51C2*R102C3

82 R69C4-R80C4

83 R82C4/R66C4

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WORK 2

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 78 [work1 xferdat3]              [work1 xferdat4]
 79 [work1 xferdat3]              [work1 xferdat4]
 80 [work1 xferdat3]              [work1 xferdat4]


 81 [work1 xferdat3]              [work1 xferdat4]
 82 [work1 xferdat3]              [work1 xferdat4]
 83 [work1 xferdat3]              [work1 xferdat4]
 84 [work1 xferdat3]


 85 [work1 xferdat3]              R26C4*R25C4/R25C2
 86 [work1 xferdat3]              R52C2*R90C3/R48C2/R26C2
 87 [work1 xferdat3]
 88 [work1 xferdat3]



 89 [work1 xferdat3]
 90 [work1 xferdat3]
 91 [work1 xferdat3]
 92 [work1 xferdat3]
 93
 94
 95
 96                               MIN(R6C5,R2C5)
 97                               IF(AND(R60C1=1,R57C1=0),(
                                  R96C4/50000000)^0.263*162
                                  307,0)
 98                               IF(AND(R61C1=1,R63C1=1),(
                                  R96C4/150000000)^0.263*20
                                  5850,0)
 99                               IF(AND(R57C1=1,R60C1=1,R6
                                  3C1=1),(R96C4/150000000)^
                                  0.263*205850,0)
100                               IF(AND(R61C1=1,R63C1=0),(
                                  R96C4/50000000)^0.389*273
                                  011,0)
101                               IF(AND(R57C1=1,R60C1=1,R6
                                  3C1=0),(R96C4/50000000)^0
                                  .389*273011,0)
```

3	4
102	IF(R25C3>=1.1*R25C2,((R15C3+R16C3)/1000*1.3*(R25C3/R25C2*R96C4/R2C5)^2)^0.886*606,0)
103	(5/R26C1*R21C1/0.2*R96C4/150000000)^0.39*94800
104	IF(R47C1=0,0.01*70*R96C4/1000,0)
105	IF(AND(R49C1=1,R48C1=0),0.01*70*R96C4/1000,0)
106	IF(AND(R49C1=1,R50C1=0),0.15*70*R96C4/1000,0)
107	IF(R59C1=0,0.08*70*R96C4/1000,0)

```
                    5                                   6
 1 R58C4
 2 R30C3
 3 R60C3
 4 R31C3
 5 R58C4/(R38C4+R40C4)
 6 MAX(R69:95C1)
 7 IF((R48C2-R30C3)/R48C2>=0,(R4
   8C2-R30C3)/R48C2,0)
 8 R38C4+R40C4
 9 R40C4/(R79C2*2000)
10 R38C4/R12C1
11 R44C4+R47C4
12 R47C4/R11C5
13 (R97C1/(1-R21C5))/(R26C5/(R2C
   5/1000000))
14 R26C5*R13C5*(1-R21C5)
15 R14C5*1000000/(R8C3+R10C3)
16 R26C5*R13C5*1000000/(R8C3+R10
   C3)
17 R35C4
18 R17C5/4.5
19 R45C4+R46C4
20 R25C4*R26C4*(R29C1+460)/1969
21 (1-((IF(R53C1=1,0.01,1))*(IF(
   R54C1=1,0.015,1))*(IF(R55C1=1
   ,0.05,1))*(IF(R56C1=1,0.15,1)
   )))
22 IF(R15C5>R42C1,1,0)
23 0.00052*R33C1*R35C4
24 (R19C5/1000*1.3*R33C1)*(IF(R8
   5C4<=1,(R85C4)^0.5,(R85C4)^2)
   )
25 (2000*R9C5/7619)^0.85*R33C1/0
   .055*101115/8760
26 R17C3+R14C3
27 R28C5*8320*R40C1*R44C1
28 ((R48C2/200000000)^0.58)*((IF
   (R60C1=1,3*(R21C1/0.2)^0.33,0
   ))+(IF(R61C1=1,4*(R21C1/0.5)^
   0.22,0)))
29 R10C5*R34C1
30 R9C5*R27C1
31 R11C5/2000*R35C1
32 R91C3*R34C5
33 ((IF(R51C1=1,0.046,0.036))*R5
   0C5)+((IF(R51C1=1,1.5,1))*(IF
   (R85C4>1,R22C2/1000*70*0.015*
   ((R85C4)^3-1)*R11C5/(R14C2+R1
   1C2),0)))
34 (IF(R60C1=1,0.8,0))+(IF(AND(R
   61C1=1,R63C1=1),0.76,0))+(IF(
   AND(R61C1=1,R63C1=0),0.72,0))
35 R32C5*R1C5
```

```
                    5                                   6
36 (SUM(R23:25C5))*R32C5
37 R29C5*R32C5
38 R30C5*R32C5
39 R31C5*R32C5
40 IF(R57C4<2500,1,0)
41 R16C5*(IF(R22C5=1,1-(IF(R17C3
   /(R17C3+R14C3)>0.21,0.985,0.9
   9)),1))
42 IF(R67C1=1,0.25,1)*((5/R26C1*
   R96C4*R9C5/R1C5*R36C1*24/40)^
   0.39*672000)
43 IF(R37C1<=0.0189,0,(5/R26C1*R
   21C1/0.1*(R96C4/150000000))^0
   .274*R37C1/0.25*1125000)
44 IF(AND(R37C1<=0.0189,R37C1=0)
   ,0,(5/R26C1*R21C1/0.2*(R96C4/
   100000000))^0.508*64923)
45 (IF(R66C1=1,1,0.3))*((R21C1/0
   .2*R96C4/100000000)^0.368*259
   691)
46 IF(AND(R59C1=1,R26C5<=(1.25*R
   96C1)),0,10)*(R96C4/100000000
   *R21C1/0.2*R26C5/R9C5/2000)^0
   .261*32461
47 IF(R15C5>R42C1,((IF(R17C3/(R1
   4C3+R17C3)>0.21,1.25,1))*(782
   20+3.747*R25C3*(R29C1+460)/19
   60*R96C4/R2C5)),0)
48 SUM(R97:101C4)
49 SUM(R42:48C5)
50 R49C5*1.32
51 R39C1
52
53 R39C5+R38C5+R37C5+R36C5+R33C5
   +R27C5+R58C5
54
55 R54C5*1000000/R35C5
56 ((R98C5-R57C5)*R39C1)/(R50C5/
   (R35C5/1000000))
57 R53C5*1000000/R35C5
58 IF(R65C1=1,R32C5*R9C5*14*R33C
   1+0.165*R32C5*R9C5,0)
59 R38C5/R27C1
60 R82C4
61 R48C2
62 R49C2
63 R82C4/R66C4
64 R6C5
65 R66C4
66 R66C4/R12C1
67 R70C4+R73C4
68 R73C4/R67C5
```

```
                    5                                   6
 69 IF(R51C2/R25C2<=2,(R51C2/R25C
    2)^1.44*0.368,1)
 70 R82C5*R69C5*(1-R77C5)
 71 R70C5*1000000/(R36C2)
 72 R82C5*R69C5*1000000/(R36C2)
 73 R63C4
 74 R73C5/4.5
 75 R71C4+R72C4
 76 R90C3*(R51C2/R48C2)*(R29C1+46
    0)/1960
 77 R21C5
 78 IF(R71C5>R42C1,1,0)
 79 0.00052*R33C1*R63C4
 80 (IF(R64C1=1,1,0))*(R57C5/1000
    *1.3*R33C1)*(IF(R86C4<=1,(R86
    C4)^0.5,(R86C4)^2))
 81 0
 82 R40C2+R37C2
 83 R84C5*8320*R40C1*R44C1
 84 ((R48C2/200000000)^0.58)*((IF
    (R60C1=1,1,0))+(IF(R61C1=1,2.
    75,0)))
 85 R66C5*R34C1
 86 R67C5/2000*R35C1
 87 R91C3+R88C5
 88 IF(R41C1=0,(IF(R60C1=1,0.95,0
    ))+(IF(AND(R61C1=1,R63C1=1),0
    .903,0))+(IF(AND(R61C1=1,R63C
    1=0),0.855,0)),R41C1)
 89 R87C5*R60C5
 90 (SUM(R79:81C5))*R87C5
 91 R85C5*R87C5
 92 R86C5+R87C5
 93 R43C1*R45C1
 94 R51C5
 95 R92C5+R91C5+R90C5+R83C5
 96 R95C5
 97 R96C5*1000000/R89C5


 98 R95C5*1000000/R89C5


 99 (R45C1)*(R43C1/2)                "avoided disposal cost"


100 (R38C5-R102C5)*R39C1/(R50C5/(  "sir w/disposal credit"
    R35C5/1000000))

101 R53C5-R99C5                     "O&M w/disposal credit"
```

	5	6
102	R101C5*1000000/R35C5	"O&M/mmBtu w/disposal credit"
103		
104		
105		
106		
107		

OUT 1

OUT1

	1	2	3	4
1	115	"THE INFORMATION ON LINES 17-105 REGARD THE ORIGINAL"		
2	R[-1]C+1	"BOILER DESIGN AND THE FUEL FOR WHICH THE"		
3	R[-1]C+1	"BOILER WAS DESIGNED. DCF MEANS DESIGN CONVENTIONAL FUEL"		
4	R[-1]C+1			
5	R[-1]C+1	"THE INFORMATION ON LINES 151-172 REGARDS THE CONVENTIONAL"		
6	R[-1]C+1	"FUEL CURRENTLY BEING UTILIZED IN THE BOILER. THE DESIGN "		
7	R[-1]C+1	"AND CURRENT FUELS ARE NOT NECESSARILY THE SAME. NEITHER ARE"		
8	R[-1]C+1	"THE AMOUNT OF FUEL HEAT VALUE ORIGINALLY INPUT (NAMEPLATE AND"		
9	R[-1]C+1	"DTOTHHVCF) AND THE MAXIMUM AMOUNT OF FUEL HEAT VALUE CURRENTLY"		
10	R[-1]C+1	"INPUT AT 100% MCR (TOTHHVCF)."		
11	R[-1]C+1			
12	R[-1]C+1			
13	R[-1]C+1	"---------- ---------- ---------- ----------"		
14	R[-1]C+1	"MCR FLOWS USING ORIGINAL DESIGN CONVENTIONAL FUEL (DCF) ONLY W/OUT RDF"		
15	R[-1]C+1			
16	R[-1]C+1			"IN"
17	R[-1]C+1			"M, LB/HR"
18	R[-1]C+1			

```
      1                2                3                4
19 R[-1]C+ "DCF SH MAF"                          R1C10
   1
20 R[-1]C+ "DCF HHV MAF"
   1
21 R[-1]C+ "ASH"                                 R2C10
   1
22 R[-1]C+ "H2O LIQUID"                          R3C10
   1
23 R[-1]C+ "AIR,CP=.24"                          R4C10
   1
24 R[-1]C+ "DPC,CP=.25"
   1
25 R[-1]C+ "H2O VAPOR"
   1
26 R[-1]C+ "CARBON, HHV ONLY"
   1
27 R[-1]C+ "LOSSES"
   1
28 R[-1]C+ "TOTALS"                              R5C10
   1
29 R[-1]C+
   1
30 R[-1]C+ "ENTHALPY TRANSFERE
   1       D TO STEAM USING DC
           F"
31 R[-1]C+ "BOILER EFFICIENCY
   1       USING DCF, A FRACTI
           ON"
32 R[-1]C+ "MASS FLOWRATE OF D
   1       CF"
33 R[-1]C+ "VOLUMETRIC FLOWRAT
   1       E FROM FURNACE W/ D
           CF"
34 R[-1]C+ "MASS FLOWRATE OF C
   1       OMBUSTION AIR W/ DC
           F"
35 R[-1]C+ "------------------
   1       ------------------
           ------------------
           ----------------"
36 R[-1]C+ "MCR FLOWS USING CU
   1       RRENT CONVENTIONAL
           FUEL (CF) ONLY WITH
           OUT RDF"
37 R[-1]C+
   1
38 R[-1]C+                                       "IN"
   1
39 R[-1]C+                                       "M, LB\HR"
   1
40 R[-1]C+
   1
```

```
      1                2                          3                    4
41 R[-1]C+ "CF SH MAF"                                 R27C10
   1
42 R[-1]C+ "CF HHV MAF"
   1
43 R[-1]C+ "ASH"                                       R28C10
   1
44 R[-1]C+ "H2O LIQUID"                                R29C10
   1
45 R[-1]C+ "AIR,CP=.24"                                R30C10
   1
46 R[-1]C+ "DPC,CP=.25"
   1
47 R[-1]C+ "H2O VAPOR"
   1
48 R[-1]C+ "CARBON, HHV ONLY"
   1
49 R[-1]C+ "LOSSES"
   1
50 R[-1]C+ "TOTALS"                                    R31C10
   1
51 R[-1]C+
   1
52 R[-1]C+ "ENTHALPY TRANSFERE
   1       D TO STEAM USING CF
           "
53 R[-1]C+ "BOLIER EFFICIENCY
   1       USING CF, A FRACTIO
           N"
54 R[-1]C+ "MASS FLOWRATE OF C
   1       F"
55 R[-1]C+ "VOLUMETRIC FLOWRAT
   1       E FROM FURNACE W/ C
           F"
56 R[-1]C+ "MASS FLOWRATE OF C
   1       OMBUSTION AIR W/ DC
           F"
57 R[-1]C+ "------------------
   1       ------------------
           ------------------
           ----------------"
58 R[-1]C+
   1
59 R[-1]C+ "THESE CALCULATIONS
   1        REPRESENT AN ITERA
           TIVE PROCEDURE"
60 R[-1]C+ "BY MEANS OF WHICH
   1       COFIRED MCR CAN BE
           DEVELOPED.  THE BES
           T"
61 R[-1]C+ "APPROXIMATION OF C
   1       OFIRED MCR IS ON LI
           NE 268"
```

```
      1                2                          3                    4
62 R[-1]C+ "RDF COFIRING FLOWS
   1       , ZEROTH ITERATION,
            CURRENT CONVENTION
           AL FUEL AND RDF"
63 R[-1]C+
   1
64 R[-1]C+                                                  "IN"
   1
65 R[-1]C+                                                  "M, LB/HR"
   1
66 R[-1]C+
   1
67 R[-1]C+
   1
68 R[-1]C+ "CF SH MAF"                                      R53C10
   1
69 R[-1]C+ "CF HHV MAF"
   1
70 R[-1]C+ "RDF SH MAF"                                     R54C10
   1
71 R[-1]C+ "RDF HHV MAF"
   1
72 R[-1]C+ "ASH"                                            R55C10
   1
73 R[-1]C+ "H2O LIQUID"                                     R56C10
   1
74 R[-1]C+ "AIR,CP=.24"                                     R57C10
   1
75 R[-1]C+ "DPC,CP=.25"
   1
76 R[-1]C+ "H2O VAPOR"
   1
77 R[-1]C+ "CARBON, HHV ONLY"
   1
78 R[-1]C+ "LOSSES"
   1
79 R[-1]C+ "TOTALS"                                         R58C10
   1
80 R[-1]C+
   1
81 R[-1]C+ "MASS FLOWRATE OF A
   1       S RCVD RDF, OIT"
82 R[-1]C+ "MASS FLOWRATE OF C
   1       F, OIT"
83 R[-1]C+ "HIGHER HEATING VAL
   1       UE OF RDF, AS-RCVD"
84 R[-1]C+ "FRAC EXCESS AIR RE
   1       QD FOR RDF COMBUSTI
           ON"
85 R[-1]C+ "ENTHALPY TRANSFERE
   1       D TO STEAM, OIT"
86 R[-1]C+ "BOILER EFFICIENCY,
   1        A FRACTION, OIT"
```

```
      1              2                                3                4
 87 R[-1]C+ "VOLUMETRIC FLOWRAT
    1       E FROM FURNACE W/ C
            F"
 88 R[-1]C+ "QUOTE TURNDOWN UNQ
    1       UOTE"
 89 R[-1]C+ "CARBON LOSS AS A F
    1       RAC OF CF FUEL VALU
            E"
 90 R[-1]C+ "CARBON LOSS AS A F
    1       RAC OF RDF FUEL VAL
            UE"
 91 R[-1]C+ "------------------
    1       ------------------
            ------------------
            ------------------
            --------------"
 92 R[-1]C+
    1
 93 R[-1]C+ "RDF COFIRING FLOWS
    1       , FIRST ITERATION,
            CURRENT CONVENTIONA
            L FUEL AND RDF"
 94 R[-1]C+
    1
 95 R[-1]C+                                            "IN"
    1
 96 R[-1]C+                                            "M, LB/HR"
    1
 97 R[-1]C+
    1
 98 R[-1]C+ "CF SH MAF"                                R87C10
    1
 99 R[-1]C+ "CF HHV MAF"
    1
100 R[-1]C+ "RDF SH MAF"                               R88C10
    1
101 R[-1]C+ "RDF HHV MAF"
    1
102 R[-1]C+ "ASH"                                      R89C10
    1
103 R[-1]C+ "H2O LIQUID"                               R90C10
    1
104 R[-1]C+ "AIR,CP=.24"                               R91C10
    1
105 R[-1]C+ "DPC,CP=.25"
    1
106 R[-1]C+ "H2O VAPOR"
    1
107 R[-1]C+ "CARBON, HHV ONLY"
    1
108 R[-1]C+ "LOSSES"
    1
```

```
      1              2                    3                    4
109 R[-1]C+ "TOTALS"                                  R92C10
    1
110 R[-1]C+
    1
111 R[-1]C+ "ENTHALPY TRANSFERE
    1       D TO STEAM ,1 IT"
112 R[-1]C+ "BOILER EFFICIENCY,
    1        A FRACTION, 1 IT"
113 R[-1]C+ "VOLUMETRIC FLOWRAT
    1       E FROM FURNACE, 1 I
            T"
```

```
                5                                                   7
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16 "IN"                  "OUT"                  "OUT"
17 "E, BTUH"            "M, LB/HR"             "E, BTUH"
18
```

	5	6	7
19	R6C10		
20	R7C10		
21		R11C10	R16C10
22	R8C10		
23	R9C10		
24		R12C10	R17C10
25		R13C10	R18C10
26		R14C10	R19C10
27			R20C10
28	R10C10	R15C10	R21C10
29			
30		R22C10	"BTUH"
31		R23C10	"NONE"
32		R24C10	"LB/HR"
33		R25C10	"ACFM"
34		R26C10	"LB/HR"
35			
36			
37			
38	"IN"	"OUT"	"OUT"
39	"E, BTUH"	"M, LB\HR"	"E, BTUH"
40			

	5	6	7
41	R32C10		
42	R33C10		
43		R37C10	R42C10
44	R34C10		
45	R35C10		
46		R38C10	R43C10
47		R39C10	R44C10
48		R40C10	R45C10
49			R46C10
50	R36C10	R41C10	R47C10
51			
52		R48C10	"BTUH"
53		R49C10	"NONE"
54		R50C10	"LB/HR"
55		R51C10	"ACFM"
56		R52C10	"LB/HR"
57			
58			
59			
60			
61			

```
          5                    6                    7
62
63
64 "IN"                 "OUT"                "OUT"
65 "E, BTUH"            "M, LB/HR"           "E, BTUH"
66
67
68 R59C10
69 R60C10
70 R61C10
71 R62C10
72                      R66C10               R71C10
73 R63C10
74 R64C10
75                      R67C10               R72C10
76                      R68C10               R73C10
77                      R69C10               R74C10
78                                           R75C10
79 R65C10               R70C10               R76C10
80
81                      R77C10               "lb/hr"
82                      R78C10               "lb/hr"
83                      R79C10               "btu/lb"
84                      R80C10               "NONE"
85                      R81C10               "btuh"
86                      R82C10               "none"
```

	5	6	7
87		R83C10	"acfm"
88		R84C10	"percent"
89		R85C10	"none"
90		R86C10	"none"
91			
92			
93			
94			
95	"IN"	"OUT"	"OUT"
96	"E, BTUH"	"M, LB/HR"	"E, BTUH"
97			
98	R93C10		
99	R94C10		
100	R95C10		
101	R96C10		
102		R100C10	R105C10
103	R97C10		
104	R98C10		
105		R101C10	R106C10
106		R102C10	R107C10
107		R103C10	R108C10
108			R109C10

```
                5                       6                       7
109 R99C10              R104C10                 R110C10
110
111                     R111C10                 "BTUH"
112                     R112C10                 "NONE"
113                     R113C10                 "ACFM"
```

```
        8                   9                   10
1                                               [work1 xferdat2]

2                                               [work1 xferdat2]

3                                               [work1 xferdat2]

4                                               [work1 xferdat2]
5                                               [work1 xferdat2]

6                                               [work1 xferdat2]

7                                               [work1 xferdat2]

8                                               [work1 xferdat2]

9                                               [work1 xferdat2]

10                                              [work1 xferdat2]
11                                              [work1 xferdat2]
12                                              [work1 xferdat2]
13                                              [work1 xferdat2]

14                                              [work1 xferdat2]

15                                              [work1 xferdat2]
16                                              [work1 xferdat2]
17                                              [work1 xferdat2]
18                                              [work1 xferdat2]
```

```
        8                   9                   10
19                                      [work1 xferdat2]
20                                      [work1 xferdat2]
21                                      [work1 xferdat2]
22                                      [work1 xferdat2]
23                                      [work1 xferdat2]
24                                      [work1 xferdat2]
25                                      [work1 xferdat2]
26                                      [work1 xferdat2]
27                                      [work1 xferdat2]
28                                      [work1 xferdat2]
29                                      [work1 xferdat2]
30                                      [work1 xferdat2]
31                                      [work1 xferdat2]
32                                      [work1 xferdat2]
33                                      [work1 xferdat2]
34                                      [work1 xferdat2]
35                                      [work1 xferdat2]
36                                      [work1 xferdat2]
37                                      [work1 xferdat2]
38                                      [work1 xferdat2]
39                                      [work1 xferdat2]
40                                      [work1 xferdat2]
```

```
        8                   9                   10
41                                  [work1 xferdat2]
42                                  [work1 xferdat2]
43                                  [work1 xferdat2]
44                                  [work1 xferdat2]
45                                  [work1 xferdat2]
46                                  [work1 xferdat2]
47                                  [work1 xferdat2]
48                                  [work1 xferdat2]
49                                  [work1 xferdat2]
50                                  [work1 xferdat2]
51                                  [work1 xferdat2]
52                                  [work1 xferdat2]
53                                  [work1 xferdat2]
54                                  [work1 xferdat2]
55                                  [work1 xferdat2]
56                                  [work1 xferdat2]
57                                  [work1 xferdat2]
58                                  [work1 xferdat2]
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62                                                  [work1 xferdat2]


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85                                                  [work1 xferdat2]
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111                                     [work1 xferdat2]

112                                     [work1 xferdat2]

113                                     [work1 xferdat2]
```

OUT 2

```
      1                2                                3
 1 232        "THE FOLLOWING TABLES
               REPRESENT THE LIMITS
               OF STEAM PRODUCTION
              BETWEEN"
 2 R[-1]C+    "WHICH RDF MAY BE COF
   1          IRED. THESE ARE THE M
              CR (MAXIMUM CONTINUOU
              S RATING)"
 3 R[-1]C+    "AND THE MAXIMUM COFI
   1          RED TURNDOWN."
 4 R[-1]C+
   1
 5 R[-1]C+    "-------------------
   1          ---------------------
              ---------------------
              ---------------------
              ---"
 6 R[-1]C+    "MCR WHILE COFIRING R
   1          DF AND CURRENT CONVEN
              TIONAL FUEL:"
 7 R[-1]C+
   1
 8 R[-1]C+
   1
 9 R[-1]C+
   1
10 R[-1]C+
   1
11 R[-1]C+    "CF SH MAF"
   1
12 R[-1]C+    "CF HHV MAF"
   1
13 R[-1]C+    "RDF SH MAF"
   1
14 R[-1]C+    "RDF HHV MAF"
   1
15 R[-1]C+    "ASH"
   1
16 R[-1]C+    "H2O LIQUID"
   1
17 R[-1]C+    "AIR, CP=.24"
   1
18 R[-1]C+    "DPC, CP=.25"
   1
19 R[-1]C+    "H2O VAPOR"
   1
20 R[-1]C+    "CARBON, HHV ONLY"
   1
21 R[-1]C+    "LOSSES"
   1
22 R[-1]C+    "TOTALS"
   1
```

```
      1              2                3
23 R[-1]C+
   1
24 R[-1]C+
   1
25 R[-1]C+ "MAX ALLOW VOLUMETRIC
   1        FLOWRATE FROM FURN"
26 R[-1]C+ "RATIO OF VDOTMCR TO
   1       VDOT1"
27 R[-1]C+ "CARBON LOSS AS A FRA
   1       C OF CF FUEL VALUE"
28 R[-1]C+ "CARBON LOSS AS A FRA
   1       C OF RDF FUEL VALUE"
29 R[-1]C+ "MAXIMUM CONTINUOUS R
   1       ATING WHILE COFIRING"
30 R[-1]C+ "BOILER EFFICIENCY AT
   1        MCR WHILE COFIRING"
31 R[-1]C+ "--------------------
   1       ----------------------
           ----------------------
           ---------------"
32 R[-1]C+ "MAXIMUM COFIRED TURN
   1       DOWN, RDF AND CURRENT
            CONVENTIONAL FUEL:"
33 R[-1]C+
   1
34 R[-1]C+
   1
35 R[-1]C+
   1
36 R[-1]C+
   1
37 R[-1]C+ "CF SH MAF"
   1
38 R[-1]C+ "CF HHV MAF"
   1
39 R[-1]C+ "RDF SH MAF"
   1
40 R[-1]C+ "RDF HHV MAF"
   1
41 R[-1]C+ "ASH"
   1
42 R[-1]C+ "H2O LIQUID"
   1
43 R[-1]C+ "AIR, CP=.24"
   1
44 R[-1]C+ "DPC, CP=.25"
   1
45 R[-1]C+ "H2O VAPOR"
   1
46 R[-1]C+ "CARBON, HHV ONLY"
   1
47 R[-1]C+ "LOSSES"
   1
```

```
      1                2                3
48 R[-1]C+ "TOTALS"
   1
49 R[-1]C+
   1
50 R[-1]C+ "VOL FLOWRATE FROM FU
   1       RNACE AT MMAX TURNDOW
           N"
51 R[-1]C+ "XXX TIMES RATIO OF D
   1       TOTHHVCF TO TOTHHVCF"
52 R[-1]C+ "CARBON LOSS AS A FRA
   1       C OF CF FUEL VALUE"
53 R[-1]C+ "CARBON LOSS AS A FRA
   1       C OF RDF FUEL VALUE"
54 R[-1]C+ "MAX TURNDOWN COFIRED
   1        STEAMRATE, BT STEAM"
55 R[-1]C+ "BOLIER EFFICIENCY AT
   1        MAX COFIRE TURNDOWN"
56 R[-1]C+ "----------------------
   1       ----------------------
           ----------------------
           ----------------------
           --"
57 R[-1]C+ "LINES BELOW SHOW THE
   1        AMOUNT OF COFIRED ST
           EAM WHICH AMY BE"
58 R[-1]C+ "SUPPLIED BY SHIFT, D
   1       AY, AND SEASON.  IT A
           LSO RESULTS IN HOURS,
           "
59 R[-1]C+ "THE TIME PER YEAR TH
   1       AT COFIRING TAKES PLA
           CE IF AVAILABILITY WE
           RE"
60 R[-1]C+ "100% AND REALDOT, AN
   1        AVERAGE ANNUAL COFIR
           ED STEAMRATE AT 100%"
61 R[-1]C+ "AVAILABILITY."
   1
62 R[-1]C+
   1
63 R[-1]C+ "     SUMMER STEAM SU
   1       PPLY, COFIRED, AVERAG
           E HOURLY, BTUH STEAM:
           "
64 R[-1]C+
   1
65 R[-1]C+
   1
66 R[-1]C+                      "MON-FRI"
   1
67 R[-1]C+                      "SAT"
   1
```

```
      1                2                        3
68 R[-1]C+                              "SUN"
   1
69 R[-1]C+
   1
70 R[-1]C+ "     WINTER STEAM SU
   1       PPLY, COFIRED, AVERAG
           E HOURLY, BTUH STEAM:
           "
71 R[-1]C+
   1
72 R[-1]C+
   1
73 R[-1]C+                              "MON-FRI"
   1
74 R[-1]C+                              "SAT"
   1
75 R[-1]C+                              "SUN"
   1
76 R[-1]C+
   1
77 R[-1]C+ "SPRING/FALL STEAM SU
   1       PPLY, COFIRED, AVERAG
           E HOURLY, BTUH STEAM:
           "
78 R[-1]C+
   1
79 R[-1]C+
   1
80 R[-1]C+
   1
81 R[-1]C+                              "MON-FRI"
   1
82 R[-1]C+                              "SAT"
   1
83 R[-1]C+                              "SUN"
   1
84 R[-1]C+ "TOTAL ANNUAL STEAM S
   1       UPPLIED COFIRED"
85 R[-1]C+ "AVG COFIRED STEAM SU
   1       PPLY RATE, THEORITICA
           L"
86 R[-1]C+ "HOURS/YR COFIRING AS
   1       SUMING 100% AVAILABIL
           ITY"
87 R[-1]C+ "REAL AVG HOURLY COFI
   1       RED STEAMRATE"
88 R[-1]C+
   1
89
90
91
92
```

	4	5	6
1			
2			
3			
4			
5			
6			
7			
8	"IN"	"IN"	"OUT"
9	"M, LB/HR"	"E, BTUH"	"M, LB/HR"
10			
11	R1C10	R7C10	
12		R8C10	
13	R2C10	R9C10	
14		R10C10	
15	R3C10		R14C10
16	R4C10	R11C10	
17	R5C10	R12C10	
18			R15C10
19			R16C10
20			R17C10
21			
22	R6C10	R13C10	R18C10

	4	5	6
23			
24			R25C10
25			R26C10
26			R27C10
27			R28C10
28			R29C10
29			R30C10
30			R31C10
31			
32			
33			
34	"IN"	"IN"	"OUT"
35	"M, LB/HR"	"E, BTUH"	"M, LB/HR"
36			
37	R32C10	R38C10	
38		R39C10	
39	R33C10	R40C10	
40		R41C10	
41	R34C10		R45C10
42	R35C10	R42C10	
43	R36C10	R43C10	
44			R46C10
45			R47C10
46			R48C10
47			

```
                4                   5                   6
48 R37C10           R44C10              R49C10
49
50                                      R56C10
51                                      R57C10
52                                      R58C10
53                                      R59C10
54                                      R60C10
55                                      R61C10
56
57
58
59
60
61
62
63
64
65                  "SHIFT 1"           "SHIFT 2"
66                  R62C10              R63C10
67                  R65C10              R66C10
```

	4	5	6
68		R68C10	R69C10
69			
70			
71			
72		"SHIFT 1"	"SHIFT 2"
73		R71C10	R72C10
74		R74C10	R75C10
75		R77C10	R78C10
76			
77			
78			
79			
80		"SHIFT 1"	"SHIFT 2"
81		R80C10	R81C10
82		R83C10	R84C10
83		R86C10	R87C10
84			R89C10
85			R90C10
86			R91C10
87			R92C10
88			
89			
90			
91			
92			

```
                7                   8                   9
 1
 2
 3
 4
 5
 6
 7
 8 "OUT"
 9 "E, BTUH"
10
11
12
13
14
15 R19C10
16
17
18 R20C10
19 R21C10
20 R22C10
21 R23C10
22 R24C10
```

```
                7                    8                    9
23
24 "ACFM"
25 "NONE"
26 "PERCENT"
27 "NONE"
28 "NONE"
29 "BTUH"
30 "NONE"
31


32


33
34 "OUT"
35 "E, BTUH"
36
37
38
39
40
41 R50C10
42
43
44 R51C10
45 R52C10
46 R53C10
47 R54C10
```

```
                7                       8                       9
48 R55C10
49
50 "CFM"
51 "NONE"
52 "NONE"
53 "NONE"
54 "BTUH"
55 "NONE"
56


57
58

59

60
61
62
63

64
65 "SHIFT 3"
66 R64C10
67 R67C10
```

```
                7                       8                       9
68 R70C10
69
70

71
72 "SHIFT 3"
73 R73C10
74 R76C10
75 R79C10
76
77

78
79
80 "SHIFT 3"
81 R82C10
82 R85C10
83 R88C10
84 "BTU"
85 "BTUH"

86 "HOURS"

87 "BTUH"
88
89
90
91
92
```

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          10
 1 [WORK1 XFERDAT3]


 2 [WORK1 XFERDAT3]


 3 [WORK1 XFERDAT3]
 4 [WORK1 XFERDAT3]
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89 [WORK1 XFERDAT3]
90 [WORK1 XFERDAT3]
91 [WORK1 XFERDAT3]
92 [WORK1 XFERDAT3]
```

OUT 3

	1	2	3	4
1	328	"--"		
2	R[-1]C+1	"AVERAGE COFIRED FLOWS, ZEROTH ITERATION, RDF AND CURRENT CONVENTIONAL FUEL "		
3	R[-1]C+1			
4	R[-1]C+1			"IN"
5	R[-1]C+1			"M, LB/HR"
6	R[-1]C+1			
7	R[-1]C+1	"CF SH MAF"		R1C10
8	R[-1]C+1	"CF HHV MAF"		
9	R[-1]C+1	"RDF SH MAF"		R2C10
10	R[-1]C+1	"RDF HHV MAF"		
11	R[-1]C+1	"ASH"		R3C10
12	R[-1]C+1	"H2O LIQUID"		R4C10
13	R[-1]C+1	"AIR, CP=.24"		R5C10
14	R[-1]C+1	"DPC, CP=.25"		
15	R[-1]C+1	"H2O VAPOR"		
16	R[-1]C+1	"CARBON, HHV ONLY"		
17	R[-1]C+1	"LOSSES"		
18	R[-1]C+1	"TOTALS"		R6C10
19	R[-1]C+1			
20	R[-1]C+1	"AVERAGE VOLUMETRIC FLOWRATE FURNACE"		
21	R[-1]C+1	"RATIO OF REALDOT TO HSTM1"		
22	R[-1]C+1	"QUOTE AVERAGE TURNDOWN UNQUOTE"		
23	R[-1]C+1	"AVG CARBON LOSS AS A FRAC OF CF FUEL VALUE"		

```
      1              2                                   3              4
24 R[-1]C+ "AVG CARBON LOSS AS
   1        A FRAC OF RDF FUEL
            VALUE"
25 R[-1]C+ "ITERATION ZERO STE
   1       AM SUPPLY COMPARED"
26 R[-1]C+ "------------------
   1       ------------------
           ------------------
           ------------------
           ----------"
27 R[-1]C+ "THE LAST TWO TABLE
   1       S LINES XXX-XXX REP
           RESENT THE FINAL"
28 R[-1]C+ "CALCULATIONS FOR F
   1       LOWS AT THE AVG COF
           IRED STEAM DEMAND"
29 R[-1]C+ "ASSUMING COMPLETE
   1       AVAILABILITY."
30 R[-1]C+
   1
31 R[-1]C+ "AVERAGE COFIRED FL
   1       OWS, FINAL ITERATIO
           N, RDF AND CURRENT
           CONVENTIONAL FUEL"
32 R[-1]C+
   1
33 R[-1]C+                                             "IN"
   1
34 R[-1]C+                                             "M, LB/HR"
   1
35 R[-1]C+
   1
36 R[-1]C+ "CF SH MAF"                                 R31C10
   1
37 R[-1]C+ "CF HHV MAF"
   1
38 R[-1]C+ "RDF SH MAF"                                R32C10
   1
39 R[-1]C+ "RDF HHV MAF"
   1
40 R[-1]C+ "ASH"                                       R33C10
   1
41 R[-1]C+ "H2O LIQUID"                                R34C10
   1
42 R[-1]C+ "AIR, CP=.24"                               R35C10
   1
43 R[-1]C+ "DPC, CP=.25"
   1
44 R[-1]C+ "H2O VAPOR"
   1
45 R[-1]C+ "CARBON, HHV ONLY"
   1
```

	1	2	3	4
46	R[-1]C+1	"LOSSES"		
47	R[-1]C+1	"TOTALS"		R36C10
48	R[-1]C+1			
49	R[-1]C+1	"FINAL AVG VOLUMETRIC FLOWRATE FROM FURN"		
50	R[-1]C+1	"ENTHALPY INTO FURNACE INC. AIR PREHEAT"		
51	R[-1]C+1	"FURNACE ADIABATIC FLAME TEMP"		
52	R[-1]C+1	"FINAL AVERAGE COFIRED STEAM"		
53	R[-1]C+1	"FINAL AVERAGE CIFIRED BOILER EFFICIENCY"		
54	R[-1]C+1	"---------- ---------- ---------- ---------- ----------"		
55	R[-1]C+1	"AVERAGE NON-COFIRED FLOWS (NO RDF), CURRENT CONVENTIONAL FUEL"		
56	R[-1]C+1			
57	R[-1]C+1			"IN"
58	R[-1]C+1			"M, LB/HR"
59	R[-1]C+1			
60	R[-1]C+1	"CF SH MAF"		R60C10
61	R[-1]C+1	"CF HHV MAF"		
62	R[-1]C+1	"ASH"		R61C10
63	R[-1]C+1	"H2O LIQUID"		R62C10
64	R[-1]C+1	"AIR, CP=.24"		R63C10
65	R[-1]C+1	"DPC, CP=.25"		
66	R[-1]C+1	"H2O VAPOR"		
67	R[-1]C+1	"CARBON, HHV ONLY"		

```
      1                2                          3                    4
68 R[-1]C+ "LOSSES"
   1
69 R[-1]C+ "TOTALS"                                          R64C10
   1
70 R[-1]C+
   1
71 R[-1]C+ "FINAL AVG NON-COFI
   1       RED VOLUMETRIC FLOW
           "
72 R[-1]C+ "FINAL AVG NON-COFI
   1       RED STEAM RATE"
73 R[-1]C+ "FINAL AVG BOILER E
   1       FFICIENCY W/ 100%"
74 R[-1]C+ "-------------------
   1       -------------------
           -------------------
           -------------------
           ------------"
75
76
77
78
79
80
81
82
83
```

	5	6	7
1			
2			
3			
4	"IN"	"OUT"	"OUT"
5	"E, BTUH"	"M, LB/HR"	"E, BTUH"
6			
7	R7C10		
8	R8C10		
9	R9C10		
10	R10C10		
11		R14C10	R19C10
12	R11C10		
13	R12C10		
14		R15C10	R20C10
15		R16C10	R21C10
16		R17C10	R22C10
17			R23C10
18	R13C10	R18C10	R24C10
19			
20		R25C10	"ACFM"
21		R26C10	"NONE"
22		R27C10	"PERCENT"
23		R28C10	"NONE"

```
          5                    6                    7
24                        R29C10               "NONE"

25                        R30C10               "BTUH"
26

27

28

29

30

31

32

33 "IN"                   "OUT"                "OUT"
34 "E, BTUH"              "M, LB/HR"           "E, BTUH"
35

36 R37C10

37 R38C10

38 R39C10

39 R40C10

40                        R44C10               R49C10
41 R41C10

42 R42C10

43                        R45C10               R50C10
44                        R46C10               R51C10
45                        R47C10               R52C10
```

	5	6	7
46			R53C10
47	R43C10	R48C10	R54C10
48			
49		R55C10	"ACFM"
50		R56C10	"BTUH"
51		R57C10	"DEG F"
52		R58C10	"BTUH"
53		R59C10	"NONE"
54			
55			
56			
57	"IN"	"OUT"	"OUT"
58	"E, BTUH"	"M, LB/HR"	"E, BTUH"
59			
60	R65C10		
61	R66C10		
62		R70C10	R75C10
63	R67C10		
64	R68C10		
65		R71C10	R76C10
66		R72C10	R77C10
67		R73C10	R78C10

```
                5                   6                   7
68                                                  R79C10
69 R69C10                       R74C10              R80C10
70
71                              R81C10              "ACFM"
72                              R82C10              "BTUH"
73                              R83C10              "NONE"
74
75
76
77
78
79
80
81
82
83
```

```
      8                    9                    10
1                                    [WORK1 XFERDAT4]

2                                    [WORK1 XFERDAT4]

3                                    [WORK1 XFERDAT4]
4                                    [WORK1 XFERDAT4]
5                                    [WORK1 XFERDAT4]
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OUT 4

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1	"SUMMARY RESULTS BEGIN ON LINE 410:"		
2	407		
3	R[-1]C+1	"UNITS"	"RDF"
4	R[-1]C+1		"COFIRING"
5	R[-1]C+1	"BTUH"	R1C12
6	R[-1]C+1	"BTUH"	R2C12
7	R[-1]C+1	"BTUH"	R3C12
8	R[-1]C+1	"NONE"	R4C12
9	R[-1]C+1	"NONE"	R5C12
10	R[-1]C+1	"BTUH"	R6C12
11	R[-1]C+1	"NONE"	R7C12
12	R[-1]C+1	"BTUH"	R8C12
13	R[-1]C+1	"TPH"	R9C12
14	R[-1]C+1	"LB/HR"	R10C12
15	R[-1]C+1	"LB/HR"	R11C12
16	R[-1]C+1	"NONE"	R12C12
17	R[-1]C+1	"NONE"	R13C12
18	R[-1]C+1	"LB/HR"	R14C12
19	R[-1]C+1	"LB/MMBTU"	R15C12
20	R[-1]C+1	"LB/MMBTU"	R16C12
21	R[-1]C+1	"LB/HR"	R17C12

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        1                2                3
22 R[-1]C+1   "ACFM"            R18C12

23 R[-1]C+1   "LB/HR"           R19C12
24 R[-1]C+1   "ACFM"            R20C12

25 R[-1]C+1   "NONE"            R21C12


26 R[-1]C+1   "NONE"            R22C12

27 R[-1]C+1   "$/HR"            R23C12

28 R[-1]C+1   "$/HR"            R24C12

29 R[-1]C+1   "$/HR"            R25C12
30 R[-1]C+1   "LB/HR"           R26C12

31 R[-1]C+1   "$/YR"            R27C12
32 R[-1]C+1   "MAN/SHIFT"       R28C12
33 R[-1]C+1   "$/HR"            R29C12
34 R[-1]C+1   "$/HR"            R30C12
35 R[-1]C+1   "$/HR"            R31C12
36 R[-1]C+1   "HOURS"           R32C12

37 R[-1]C+1   "$/YR"            R33C12
38 R[-1]C+1   "NONE"            R34C12
39 R[-1]C+1   "BTU"             R35C12
40 R[-1]C+1   "$/YR"            R36C12
41 R[-1]C+1   "$/YR"            R37C12
42 R[-1]C+1   "$/YR"            R38C12
43 R[-1]C+1   "$/YR"            R39C12
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	1	2	3
44	R[-1]C+1	"$/YR"	0
45	R[-1]C+1		
46	R[-1]C+1	"NONE"	R40C12
47	R[-1]C+1	"LB/MMBTU"	R41C12
48	R[-1]C+1		
49	R[-1]C+1		
50	R[-1]C+1	"$"	R42C12
51	R[-1]C+1	"$"	R43C12
52	R[-1]C+1	"$"	R44C12
53	R[-1]C+1	"$"	R45C12
54	R[-1]C+1	"$"	R46C12
55	R[-1]C+1	"$"	R47C12
56	R[-1]C+1	"$"	R48C12
57	R[-1]C+1	"$"	R49C12
58	R[-1]C+1	"$"	R50C12
59	R[-1]C+1	"NONE"	R51C12
60	R[-1]C+1	"$/YR"	R52C12
61	R[-1]C+1	"$/YR"	R53C12
62	R[-1]C+1	"$/YR"	R54C12
63	R[-1]C+1	"$/MMBTU"	R55C12
64	R[-1]C+1	"NONE"	R56C12

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        1                2                3
65 R[-1]C+1   "$/MMBTU"        R57C12

66 R[-1]C+1   "$/YR"           R58C12


67 R[-1]C+1   "TPY"            R59C12

68 473        "$/YR"           R99C12

69 474        "NONE"           R100C12

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3	"CONVENTIONAL"		"VARIABLE"
4	"FUEL"		"DEFINITION"
5	R60C12		"ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY"
6	R61C12		"MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)"
7	"NA"		"MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH"
8	R62C12		"BOILER EFFICIENCY AT MCR"
9	R63C12		"BOILER EFFICIENCY AT AVERGE OUTPUT"
10	R64C12		"MAXIMUM STEAM DEMAND (MSD)"
11	"NA"		"DERATE"
12	R65C12		"TOTAL FUEL INPUT ENTHALPY, AVERAGE"
13	"NA"		"RDF FLOWRATE, AVERAGE"
14	R66C12		"CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE"
15	R67C12		"SOLID RESIDUE GENERATED, AVERAGE"
16	R68C12		"CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR"
17	R69C12		"FLYASH FRACTION OF SOLID RESIDUE, AVERAGE"
18	R70C12		"FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR"
19	R71C12		"EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR"
20	R72C12		"UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR"
21	R73C12		"COMBUSTION AIR RATE, AVERAGE"

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22	R74C12		"COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE"
23	R75C12		"WET FLUE GAS RATE, AVERAGE"
24	R76C12		"WET FLUE GAS VOLUMETRIC FLOW, AVERAGE"
25	R77C12		"EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)"
26	R78C12		"NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES"
27	R79C12		"ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE"
28	R80C12		"ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE"
29	R81C12		"MISC ELECTRIC POWER COSTS, AVERAGE"
30	R82C12		"SOLID RESIDUE GENERATED, MAX HOURLY AT MCR"
31	R83C12		"ANNUAL LABOR COST, BURDENED"
32	R84C12		"OPERATORS PER SHIFT"
33	R85C12		"CONVENTIONAL FUEL COST, AVERGAE"
34	"NA"		"RDF FUEL COST, AVERAGE"
35	R86C12		"ASH DISPOSAL COST, AVERAGE"
36	R87C12		"OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE"
37	"NA"		"INCREMENTAL MAINTENANCE COST, ANNUAL"
38	R88C12		"AVAILABILITY, FRACTION"
39	R89C12		"ANNUAL STEAM PRODUCTION, NET"
40	R90C12		"RELATIVE ELECTRIC POWER ANNUAL COST"
41	R91C12		"ANNUAL CONVENTIONAL FUEL COST"
42	"NA"		"ANNUAL RDF FUEL COST"
43	R92C12		"ANNUAL ASH DISPOSAL COST"

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44	R93C12		"ANNUAL MSW DISPOSAL COST"
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46	"NA"		"FURNACE COLD (MAKING CO & SMOKE) IF = 1"
47	"NA"		"NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE"
48			" INCLUDED IN CAPITAL COST"
49			
50	"NA"		"BARE CAPITAL COST OF STORAGE SUBSYSTEM"
51	"NA"		"BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR"
52	"NA"		"BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR"
53	"NA"		"BARE CAPITAL COST OF RDF DELIVERY SYSTEM"
54	"NA"		"BARE INCREMEMTAL COST OF ASH HANDLING SYSTEM"
55	"NA"		"BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL"
56	"NA"		"BARE INCREMENTAL COST FOR BOILER MODIFICATIONS"
57	"NA"		"BARE TOTAL INCREMENTAL CAPITAL COSTS"
58	"NA"		"BURDENED TOTAL INCREMENTAL CAPITAL COSTS"
59	R94C12		"CAPITAL RECOVERY FACTOR"
60	"NA"		"ANNUALIZED COST OF CAPITAL"
61	R95C12		"TOTAL ANNUAL O&M COST"
62	R96C12		"TOTAL ANNUAL COST INCLUDING COST OF CAPITAL"
63	R97C12		"TOTAL COAT PER MILLION BTU OF STEAM"
64	"NA"		"SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION"

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65	R98C12		"TOTAL O&M COST PER MILLION BTU OF STEAM"
66	"NA"		"O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF "
67	"NA"		"TONS PER YEAR RDF REQUIRED"
68	"NA"		"Avoided disposal cost"
69	"NA"		"SIR w/disposal credit"
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APPENDIX E

COMPLETE OPERATIONAL AND ECONOMIC DATA OUTPUTS FOR THE SENSITIVITY AND BEST CASE ANALYSIS

Summary of Sensitivity Analysis Little Creek Amphibious Base	A Baseline		1 Steam demand		2		3 RDF Moisture		4	
definition	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	5.82E+07	5.82E+07	6.48E+07	6.48E+07	6.48E+07	6.48E+07	5.91E+07	5.91E+07	5.69E+07	5.69E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	8.64E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07	8.83E+07	8.45E+07	8.39E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	2.06E+07		2.06E+07		2.06E+07		2.08E+07		2.02E+07	
BOILER EFFICIENCY AT MCR	0.76	0.83	0.76	0.83	0.76	0.83	0.77	0.83	0.75	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	0.71	0.83	0.71	0.83	0.71	0.83	0.71	0.83	0.69	0.83
MAXIMUM STEAM DEMAND (MSD)	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	0		0		0		0		0.01	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	8.24E+07	7.00E+07	9.09E+07	7.79E+07	9.09E+07	7.79E+07	8.27E+07	7.12E+07	8.21E+07	6.85E+07
RDF FLOWRATE, AVERAGE	2.62		2.89		2.89		2.3		3.04	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	3585	5073	3953	5648	3953	5648	3597	5158	3568	4964
SOLID RESIDUE GENERATED, AVERAGE	1375	425	1475	474	1475	474	1313	432	1458	416
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	0.44	0.17	0.42	0.17	0.42	0.17	0.46	0.17	0.41	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	0.15	0.34	0.15	0.34	0.15	0.34	0.16	0.34	0.13	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	2	2	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	1.83	2.06	1.83	2.06	1.83	2.06	1.85	2.06	1.81	2.06
COMBUSTION AIR RATE, AVERAGE	80045	67977	88277	75677	88277	75677	80333	69105	79685	66512
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	17788	15106	19617	16817	19617	16817	17852	15357	17708	14781
WET FLUE GAS RATE, AVERAGE	87489	72625	96528	80851	96528	80851	87214	73830	87874	71060
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	22971	26798	28470	29834	28470	29834	22954	27243	23066	26221
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONATOL DEVICE REQUIRED 1= YES	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$0.87	$0.74	$0.96	$0.83	$0.96	$0.83	$0.88	$0.75	$0.87	$0.73
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$1.79	$0.00	$2.20	$0.00	$2.20	$0.00	$1.79	$0.00	$1.80	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$3.20	$0.00	$3.48	$0.00	$3.48	$0.00	$2.87	$0.00	$3.64	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	1429	618	1429	618	1429	618	1354	618	1527	618
ANNUAL LABOR COST, BURDENED	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	2.31	1.67	2.31	1.67	2.31	1.67	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERGAE	$106.00	$150.00	$117.00	$167.00	$117.00	$167.00	$106.00	$152.00	$105.00	$146.00
RDF FUEL COST, AVERAGE	$5.00		$6.00		$6.00		$5.00		$6.00	
ASH DISPOSAL COST, AVERAGE	$10.45	$3.23	$11.20	$3.60	$11.20	$3.60	$9.97	$3.28	$11.07	$3.16
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	6290	7862	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$25,773		$25,754		$25,754		$25,702		$25,837	
AVAILABILITY, FRACTION	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	3.66E+11	4.57E+11	4.07E+11	5.09E+11	4.07E+11	5.09E+11	3.72E+11	4.65E+11	3.58E+11	4.48E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$36,923	$5,837	$41,810	$6,498	$41,810	$6,498	$34,796	$5,934	$39,704	$5,711
ANNUAL CONVENTIONAL FUEL COST	$665,122	$1,176,749	$733,517	$1,310,042	$733,517	$1,310,042	$667,511	$1,196,276	$662,124	$1,151,398
ANNUAL RDF FUEL COST	$32,925		$36,311		$36,311		$28,913		$38,239	
ANNUAL ASH DISPOSAL COST	$65,710	$25,399	$70,450	$28,276	$70,450	$28,276	$62,711	$25,820	$69,660	$24,852
ANNUAL MSW DISPOSAL COST	$0	$102,393	$0	$102,393	$0	$102,393	$0	$102,393	$0	$102,393
FURNACE COLD (MAKING CO & SMOKE) IF = 1	0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	1.83		1.83		1.83		1.85		1.81	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$109,411		$109,010		$109,010		$104,234		$115,640	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$95,263		$95,263		$95,263		$96,041		$94,835	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$337,682		$337,682		$337,682		$340,600		$333,835	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$542,356		$541,955		$541,955		$540,875		$543,710	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$715,910		$715,380		$715,380		$713,955		$717,697	
CAPITAL RECOVERY FACTOR	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$1,163,858	$1,451,622	$1,245,248	$1,588,454	$1,245,248	$1,588,454	$1,157,039	$1,471,669	$1,172,970	$1,425,599
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$0	$1,451,622	$0	$1,588,454	$0	$1,588,454	$0	$1,471,669	$0	$1,425,599
TOTAL COST PER MILLION BTU OF STEAM	$0.00	$3.17	$0.00	$3.12	$0.00	$3.12	$0.00	$3.16	$0.00	$3.19
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	-0.03		0.34		0.34		0.27		-0.43	
TOTAL O&M COST PER MILLION BTU OF STEAM	$3.18	$3.17	$3.06	$3.12	$3.06	$3.12	$3.11	$3.16	$3.28	$3.19
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$0.00		$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	16463		18155		18155		14456		19120	

Summary of Sensitivity Analysis
Little Creek Amphibious Base

definition	5 Excess Air RDF Cofiring	5 Excess Air Conventional Fuel	6 RDF Cofiring	6 Conventional Fuel	7 Percent Ash RDF Cofiring	7 Percent Ash Conventional Fuel	8 RDF Cofiring	8 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	6.17E+07	6.17E+07	5.51E+07	5.51E+07	5.79E+07	5.79E+07	5.74E+07	5.74E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	9.33E+07	8.52E+07	8.03E+07	8.38E+07	8.57E+07	8.45E+07	8.49E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	2.07E+07		2.94E+07		2.05E+07		2.03E+07	
BOILER EFFICIENCY AT MCR	0.77	0.84	0.76	0.82	0.76	0.83	0.76	0.83
BOILER EFFICIENCY AT AVERSE OUTPUT	0.72	0.84	0.7	0.82	0.7	0.83	0.7	0.83
MAXIMUM STEAM DEMAND (MSD)	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	0		0.04		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	8.61E+07	7.36E+07	7.92E+07	6.69E+07	8.24E+07	6.96E+07	8.23E+07	6.91E+07
RDF FLOWRATE, AVERAGE	2.73		2.51		3.05		3.66	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	3745	5333	3444	4849	3582	5046	3578	5008
SOLID RESIDUE GENERATED, AVERAGE	1417	447	1337	406	2072	423	3046	420
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	0.43	0.17	0.44	0.17	0.29	0.17	0.2	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	0.15	0.31	0.14	0.38	0.09	0.34	0.06	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	1.85	1.86	1.82	2.27	1.83	2.06	1.81	2.06
COMBUSTION AIR RATE, AVERAGE	77335	66076	82691	69848	79984	67607	79899	67095
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	17185	14684	18376	15522	17774	15024	17755	14910
WET FLUE GAS RATE, AVERAGE	85131	70962	89828	74290	87596	72230	87746	71682
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	23662	26222	22780	27378	22988	26653	23030	26450
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$0.84	$0.72	$0.90	$0.76	$0.87	$0.74	$0.87	$0.73
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$1.77	$0.00	$1.83	$0.00	$1.80	$0.00	$1.80	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$3.32	$0.00	$3.10	$0.00	$3.65	$0.00	$4.26	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	1530	618	1342	618	2379	618	3698	618
ANNUAL LABOR COST, BURDENED	$339,001	$244,790	$335,804	$242,482	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	2.32	1.68	2.3	1.66	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERGAE	$110.00	$157.00	$102.00	$143.00	$106.00	$149.00	$106.00	$148.00
RDF FUEL COST, AVERAGE	$5.00		$5.00		$6.00		$7.00	
ASH DISPOSAL COST, AVERAGE	$10.76	$3.40	$10.15	$3.09	$15.74	$3.21	$23.13	$3.19
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$26,523		$25,086		$26,031		$26,348	
AVAILABILITY, FRACTION	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	3.88E+11	4.85E+11	3.47E+11	4.34E+11	3.64E+11	4.55E+11	3.61E+11	4.52E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$37,359	$5,674	$36,684	$5,998	$39,742	$5,805	$43,590	$5,761
ANNUAL CONVENTIONAL FUEL COST	$694,841	$1,236,848	$639,052	$1,124,586	$664,612	$1,170,352	$663,907	$1,161,479
ANNUAL RDF FUEL COST	$34,396		$31,635		$38,383		$46,011	
ANNUAL ASH DISPOSAL COST	$67,694	$26,696	$63,848	$24,273	$99,000	$25,261	$145,514	$25,069
ANNUAL MSW DISPOSAL COST	$0	$102,393	$0	$102,393	$0	$102,393	$0	$102,393
FURNACE COLD (MAKING CO & SMOKE) IF = 1	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	1.85		1.82		1.83		1.81	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$112,137		$106,911		$116,070		$124,442	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$98,012		$92,743		$95,005		$94,646	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$347,993		$328,249		$336,718		$335,373	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$558,141		$527,904		$547,793		$554,462	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$736,746		$696,033		$723,087		$731,889	
CAPITAL RECOVERY FACTOR	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$1,199,815	$1,514,008	$1,132,109	$1,397,338	$1,205,174	$1,445,056	$1,262,774	$1,435,947
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$0	$1,514,008	$0	$1,397,338	$0	$1,445,056	$0	$1,435,947
TOTAL COAT PER MILLION BTU OF STEAM	$0.00	$3.12	$0.00	$3.22	$0.00	$3.18	$0.00	$3.18
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	0.15		-0.19		-0.65		-1.49	
TOTAL O&M COST PER MILLION BTU OF STEAM	$3.09	$3.12	$3.26	$3.22	$3.31	$3.18	$3.50	$3.18
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	17198		15817		19192		23005	

Summary of Sensitivity Analysis
Little Creek Amphibious Base

definition	9 RDF HHV RDF Cofiring	9 Conventional Fuel	10 RDF Cofiring	10 Conventional Fuel	11 RDF Cost RDF Cofiring	11 Conventional Fuel	12 RDF Cofiring	12 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	5.65E+07	5.65E+07	5.74E+07	5.74E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	8.29E+07	8.45E+07	8.48E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	2.01E+07		2.04E+07		2.06E+07		2.06E+07	
BOILER EFFICIENCY AT MCR	0.75	0.83	0.76	0.83	0.76	0.83	0.76	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	0.69	0.83	0.7	0.83	0.71	0.83	0.71	0.83
MAXIMUM STEAM DEMAND (MSD)	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	0.02		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	8.18E+07	6.79E+07	8.21E+07	6.91E+07	8.24E+07	7.00E+07	8.24E+07	7.00E+07
RDF FLOWRATE, AVERAGE	3.34		2.93		2.62		2.62	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	3556	4923	3572	5007	3585	5073	3585	5073
SOLID RESIDUE GENERATED, AVERAGE	1516	413	1437	420	1375	425	1375	425
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	0.4	0.17	0.42	0.17	0.44	0.17	0.44	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	0.12	0.34	0.14	0.34	0.15	0.34	0.15	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	1.8	2.06	1.82	2.06	1.83	2.06	1.83	2.06
COMBUSTION AIR RATE, AVERAGE	79405	65958	79759	67082	80045	67977	80045	67977
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	17646	14657	17724	14907	17788	15106	17788	15106
WET FLUE GAS RATE, AVERAGE	88121	70468	87761	71669	87489	72625	87489	72625
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	23087	26002	23002	26446	22971	26798	22971	26798
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$0.87	$0.72	$0.87	$0.73	$0.87	$0.74	$0.87	$0.74
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$1.81	$0.00	$1.80	$0.00	$1.79	$0.00	$1.79	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$3.94	$0.00	$3.53	$0.00	$3.20	$0.00	$3.20	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	1600	618	1505	618	1429	618	1429	618
ANNUAL LABOR COST, BURDENED	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	2.31	1.67	2.31	1.67	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERGAE	$105.00	$145.00	$105.00	$148.00	$106.00	$150.00	$106.00	$150.00
RDF FUEL COST, AVERAGE	$7.00		$6.00		$101.00		$50.00	
ASH DISPOSAL COST, AVERAGE	$11.52	$3.13	$10.92	$3.19	$10.45	$3.23	$10.45	$3.23
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$25,946		$25,859		$25,773		$25,773	
AVAILABILITY, FRACTION	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	3.55E+11	4.44E+11	3.61E+11	4.51E+11	3.66E+11	4.57E+11	3.66E+11	4.57E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$41,617	$5,664	$39,000	$5,760	$36,923	$5,837	$36,923	$5,837
ANNUAL CONVENTIONAL FUEL COST	$659,801	$1,141,795	$662,743	$1,161,261	$665,122	$1,176,749	$665,122	$1,176,749
ANNUAL RDF FUEL COST	$41,994		$36,908		$633,314		$316,739	
ANNUAL ASH DISPOSAL COST	$72,432	$24,644	$68,669	$25,065	$65,710	$25,399	$65,710	$25,399
ANNUAL MSW DISPOSAL COST	$0	$102,393	$0	$102,393	$0	$102,393	$0	$102,393
FURNACE COLD (MAKING CO & SMOKE) IF = 1	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	1.8		1.82		1.83		1.83	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$119,800		$114,188		$109,411		$109,411	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$93,841		$94,637		$95,263		$95,263	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$332,359		$335,340		$337,682		$337,682	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$546,001		$544,165		$542,356		$542,356	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$720,721		$718,298		$715,910		$715,910	
CAPITAL RECOVERY FACTOR	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$1,179,196	$1,415,741	$1,170,584	$1,435,724	$1,764,247	$1,451,623	$1,447,672	$1,451,623
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$0	$1,415,741	$0	$1,435,724	$0	$1,451,623	$0	$1,451,623
TOTAL COST PER MILLION BTU OF STEAM	$0.00	$3.19	$0.00	$3.18	$0.00	$3.17	$0.00	$3.17
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	-0.62		-0.29		-8.03		-3.82	
TOTAL O&M COST PER MILLION BTU OF STEAM	$3.32	$3.19	$3.24	$3.18	$4.82	$3.17	$3.96	$3.17
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	20997		18454		16463		16463	

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Summary of Sensitivity Analysis Little Creek Amphibious Base	13 Cofire Ratio		14		15 Conventional Fuel Cost		16	
Definition	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	6.08E+07	6.08E+07	5.57E+07	5.57E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	9.16E+07	8.45E+07	8.14E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	2.15E+07		1.96E+07		2.06E+07		2.06E+07	
BOILER EFFICIENCY AT MCR	0.79	0.83	0.79	0.83	0.76	0.83	0.76	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	0.76	0.83	0.65	0.83	0.71	0.83	0.71	0.83
MAXIMUM STEAM DEMAND (MSD)	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	0		0.04		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	8.04E+07	7.31E+07	8.51E+07	6.70E+07	8.24E+07	7.00E+07	8.24E+07	7.00E+07
RDF FLOWRATE, AVERAGE	1.28		4.05		2.62		2.62	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	4660	5300	2466	4856	3585	5073	3585	5073
SOLID RESIDUE GENERATED, AVERAGE	982	444	1803	407	1375	425	1375	425
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	0.41	0.17	0.45	0.17	0.44	0.17	0.44	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	0.2	0.34	0.11	0.34	0.15	0.34	0.15	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	1.9	2.06	1.76	2.06	1.83	2.06	1.83	2.06
COMBUSTION AIR RATE, AVERAGE	78041	71017	82611	65069	80045	67977	80045	67977
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	17342	15782	18358	14460	17788	15106	17788	15106
WET FLUE GAS RATE, AVERAGE	84270	75873	91378	69519	87489	72625	87489	72625
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	23119	27997	22972	25652	22971	26798	22971	26798
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED (= YES	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$0.85	$0.78	$0.90	$0.71	$0.87	$0.74	$0.87	$0.74
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$1.73	$0.00	$1.87	$0.00	$1.79	$0.00	$1.79	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$1.74	$0.00	$4.64	$0.00	$3.20	$0.00	$3.20	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	1121	618	1725	618	1429	618	1429	618
ANNUAL LABOR COST, BURDENED	$289,685	$243,638	$368,636	$243,638	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	1.98	1.67	2.53	1.67	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERGAE	$137.00	$156.00	$73.00	$143.00	$159.00	$225.00	$211.00	$299.00
RDF FUEL COST, AVERAGE	$3.00		$8.00		$5.00		$5.00	
ASH DISPOSAL COST, AVERAGE	$7.46	$3.37	$13.69	$3.09	$10.45	$3.23	$10.45	$3.23
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$23,952		$26,950		$25,773		$25,773	
AVAILABILITY, FRACTION	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	3.82E+11	4.78E+11	3.50E+11	4.38E+11	3.66E+11	4.57E+11	3.66E+11	4.57E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$27,196	$6,098	$46,665	$5,587	$36,923	$5,837	$36,923	$5,837
ANNUAL CONVENTIONAL FUEL COST	$864,619	$1,229,386	$457,627	$1,126,416	$997,683	$1,765,123	$1,330,245	$2,353,497
ANNUAL RDF FUEL COST	$16,050		$50,971		$32,925		$32,925	
ANNUAL ASH DISPOSAL COST	$46,934	$26,535	$86,135	$24,313	$65,710	$25,399	$65,710	$25,399
ANNUAL MSW DISPOSAL COST	$0	$102,393	$0	$102,393	$0	$102,393	$0	$102,393
FURNACE COLD (MAKING CO & SMOKE) IF = 1	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	1.9		1.76		1.83		1.83	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$83,151		$128,953		$109,411		$109,411	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$75,422		$108,202		$95,263		$95,263	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$345,458		$329,974		$337,682		$337,682	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$504,030		$567,130		$542,356		542356.00	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$565,320		$748,612		$715,910		$715,910	
CAPITAL RECOVERY FACTOR	9.54	9.54	9.54	9.54	9.54	9.54	$9.54	$9.54
ANNUALIZED COST OF CAPITAL	$0		$0			$0	0	
TOTAL ANNUAL O&M COST	$1,368,436	$1,505,657	$1,037,234	$1,399,954	$2,039,997	$1,828,980	$1,828,980	$2,628,371
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$0	$1,505,657	$0	$1,399,954	$2,039,997	$0	$0	$2,628,371
TOTAL COAT PER MILLION BTU OF STEAM	$0.00	$3.15	$0.00	$3.20	$4.46	$0.00	$0.00	$5.75
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	-0.92		1.05			3.65	3.65	
TOTAL O&M COST PER MILLION BTU OF STEAM	$3.32	$3.15	$2.96	$3.20	$4.46	$5.00	$5.00	$5.75
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$0.00		$0.00			$0.00	$0.00	
TONS PER YEAR RDF REQUIRED	8025		25485			16463	16463	

Summary of Sensitivity Analysis	17		18		19		20	
Little Creek Amonibious Base	MSW Disposal				Ash Disposal			
	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
definition								
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	8.64E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	2.06E+07		2.06E+07		2.06E+07		2.06E+07	
BOILER EFFICIENCY AT MCR	.76	0.83	0.76	0.83	0.76	0.83	0.76	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	0.71	0.83	0.71	0.83	0.69	0.83	0.68	0.83
MAXIMUM STEAM DEMAND (MSD)	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	8.24E+07	7.00E+07	8.24E+07	7.00E+07	8.39E+07	7.00E+07	8.51E+07	7.00E+07
RDF FLOWRATE, AVERAGE	2.62		2.62		2.66		2.7	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	3585	5073	3585	5073	3648	5073	3702	5073
SOLID RESIDUE GENERATED, AVERAGE	1375	425	1375	425	1472	425	1553	425
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	0.44	0.17	0.44	0.17	0.46	0.17	0.49	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	0.15	0.34	0.15	0.34	0.15	0.34	0.15	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	1.83	2.06	1.83	2.06	1.83	2.06	1.83	2.06
COMBUSTION AIR RATE, AVERAGE	80045	67977	80045	67977	81470	67977	82670	67977
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	17788	15106	17788	15106	18104	15106	18371	15106
WET FLUE GAS RATE, AVERAGE	87489	72625	87489	72625	88974	72625	90225	72625
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	22971	26798	22971	26798	22971	26798	22971	26798
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$0.87	$0.74	$0.87	$0.74	$0.89	$0.74	$0.90	$0.74
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$1.79	$0.00	$1.79	$0.00	$1.82	$0.00	$1.85	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$3.20	$0.00	$3.20	$0.00	$3.25	$0.00	$3.29	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	1429	618	1429	618	1429	618	1429	618
ANNUAL LABOR COST, BURDENED	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	2.31	1.67	2.31	1.67	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERGAE	$106.00	$150.00	$106.00	$150.00	$108.00	$150.00	$109.00	$150.00
RDF FUEL COST, AVERAGE	$5.00		$5.00		$5.00		$5.00	
ASH DISPOSAL COST, AVERAGE	$10.45	$3.23	$10.45	$3.23	$16.77	$4.85	$23.59	$6.46
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$25,773		$25,773		$25,809		$25,839	
AVAILABILITY, FRACTION	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	3.66E+11	4.57E+11	3.66E+11	4.57E+11	3.66E+11	4.57E+11	3.66E+11	4.57E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$36,923	$5,837	$36,923	$5,837	$37,516	$5,837	$38,016	$5,837
ANNUAL CONVENTIONAL FUEL COST	$665,122	$1,176,749	$665,122	$1,176,749	$676,955	$1,176,749	$686,931	$1,176,749
ANNUAL RDF FUEL COST	$32,925		$32,925		$33,511		$34,005	
ANNUAL ASH DISPOSAL COST	$65,710	$25,399	$65,710	$25,399	$105,494	$38,107	$148,390	$50,798
ANNUAL MSW DISPOSAL COST	$0	$153,590	$0	$204,786	$0	$102,393	$0	$102,393
FURNACE COLD (MAKING CO & SMOKE) IF = 1	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	1.83		1.83		1.83		1.83	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$109,411		$109,411		$110,167		$110,797	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$95,263		$95,263		$95,263		$95,263	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$337,682		$337,682		$337,682		$337,682	

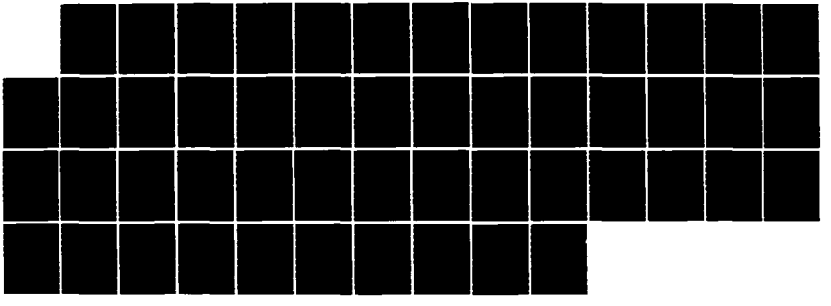
BARE TOTAL INCREMENTAL CAPITAL COSTS	542356.00		542356.00		543111.00		543742.00	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$715,910		$715,910		$716,907		$717,739	
CAPITAL RECOVERY FACTOR	$9.54	$9.54	$9.54	$9.54	$9.54	$9.54	$9.54	$9.54
ANNUALIZED COST OF CAPITAL	0		0		0		0	
TOTAL ANNUAL O&M COST	$1,163,858	$1,451,622	$1,163,858	$1,451,622	$1,216,690	$1,464,330	$1,270,586	$1,477,021
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$0	$1,451,622	$0	$1,451,622	$0	$1,464,330	$0	$1,477,021
TOTAL COAT PER MILLION BTU OF STEAM	$0.00	$3.17	$0.00	$3.17	$0.00	$3.20	$0.00	$3.23
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	-0.03		-0.03		-0.60		-1.18	
TOTAL O&M COST PER MILLION BTU OF STEAM	$3.18	$3.17	$3.18	$3.17	$3.32	$3.20	$3.47	$3.23
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	16463		16463		16755		17002	

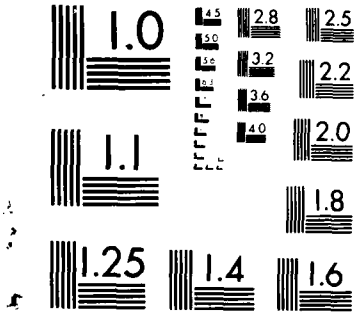
Summary of Sensitivity Analysis
Little Creek Amphibious Base

definition	UNITS	Sens 21:SIR w/ credit Actual MSW $ RDF Cofiring	Sens 21:SIR w/ credit Actual MSW $ Conventional Fuel	Sens 22:SIR w/ credit MSW $ + 50% RDF Cofiring	Sens 22:SIR w/ credit MSW $ + 50% Conventional Fuel	Sens 23:SIR w/ credit MSW $ +100% RDF Cofiring	Sens 23:SIR w/ credit MSW $ +100% Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07	5.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.64E+07	8.45E+07	8.64E+07	8.45E+07	8.64E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	2.06E+07		2.06E+07		2.06E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.83	0.76	0.83	0.76	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.71	0.83	0.71	0.83	0.71	0.83
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	8.24E+07	7.00E+07	8.24E+07	7.00E+07	8.24E+07	7.00E+07
RDF FLOWRATE, AVERAGE	TPH	2.62		2.62		2.62	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	3585	5073	3585	5073	3585	5073
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1375	425	1375	425	1375	425
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.44	0.17	0.44	0.17	0.44	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.15	0.34	0.15	0.34	0.15	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.83	2.06	1.83	2.06	1.83	2.06
COMBUSTION AIR RATE, AVERAGE	LB/HR	80045	67977	80045	67977	80045	67977
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	17788	15106	17788	15106	17788	15106
WET FLUE GAS RATE, AVERAGE	LB/HR	87489	72625	87489	72625	87489	72625
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	22971	26798	22971	26798	22971	26798
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.87	$0.74	$0.87	$0.74	$0.87	$0.74
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.79	$0.00	$1.79	$0.00	$1.79	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$3.20	$0.00	$3.20	$0.00	$3.20	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1429	618	1429	618	1429	618
ANNUAL LABOR COST, BURDENED	$/YR	$337,406	$243,638	$337,406	$243,638	$337,406	$243,638
OPERATORS PER SHIFT	MAN/SHIF	2.31	1.67	2.31	1.67	2.31	1.67
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$106.00	$150.00	$106.00	$150.00	$106.00	$150.00
RDF FUEL COST, AVERAGE	$/HR	$5.00		$5.00		$5.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$10.45	$3.23	$10.45	$3.23	$10.45	$3.23
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$25,773		$25,773		$25,773	
AVAILABILITY, FRACTION	NONE	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	BTU	3.66E+11	4.57E+11	3.66E+11	4.57E+11	3.66E+11	4.57E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$36,923	$5,837	$36,923	$5,837	$36,923	$5,837
ANNUAL CONVENTIONAL FUEL COST	$/YR	$665,122	$1,176,749	$665,122	$1,176,749	$665,122	$1,176,749
ANNUAL RDF FUEL COST	$/YR	$32,925		$32,925		$32,925	
ANNUAL ASH DISPOSAL COST	$/YR	$65,710	$25,399	$65,710	$25,399	$65,710	$25,399
ANNUAL MSW DISPOSAL COST	$/YR	$0	$102,393	$0	$153,590	$0	$204,786
FURNACE COLD (MARKING CO & SMOKE) IF = 1	NONE	0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	1.83		1.83		1.83	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$109,411		$109,411		$109,411	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,263		$95,263		$95,263	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$337,682		$337,682		$337,682	

AD-A173 981 RDF (REFUSE-DERIVED FUEL) CO-FIRING COST/BENEFIT ANALYSIS USING THE NCEL R..(U) SYSTECH CORP XENIA OH H BELENCAN ET AL. AUG 86 NCEL-CR-86.012-VOL-2 3/3

UNCLASSIFIED N00123-83-D-0149 F/G 21/4 NL





BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$542,356		$542,356		$542,356	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$715,910		$715,910		$715,910	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	0		0		0	
TOTAL ANNUAL O&M COST	$/YR	$1,163,858	$1,451,622	$1,163,858	$1,451,622	$1,163,858	$1,451,622
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$1,451,622	$0	$1,451,622	$0	$1,451,622
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0	$3	$0	$3	$0	$3
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.03		-0.03		-0.03	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$3.18	$3.17	$3.18	$3.17	$3.18	$3.17
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	16463		16463		16463	
Avoided MSW disposal cost	$/YR	$28,577		$54,175		$79,773	
SIR w/disposal credit	NONE	0.35		0.69		1.03	

E14

E15

cc navy/Little

Summary of Sensitivity Analysis
Little Creek Amphibious Base

Definition	UNITS	Conventional Fuel Down 25% RDF Cofiring	Conventional Fuel Down 25% Conventional Fuel	Excess air Plus 20% RDF Cofiring	Excess air Plus 20% Conventional Fuel	Best Case #1 RDF Cofiring	Best Case #1 Conventional Fuel	Best Case #2 RDF Cofiring	Best Case #2 Conventional Fuel	Best Case #3 RDF Cofiring	Best Case #3 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.82E+07	5.82E+07	5.51E+07	5.51E+07	6.82E+07	6.82E+07	6.31E+07	6.31E+07	5.71E+07	5.71E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.64E+07	8.45E+07	8.03E+07	8.38E+07	9.09E+07	8.52E+07	8.41E+07	8.45E+07	8.41E+07	8.45E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.06E+07		3.04E+07		3.02E+07		3.00E+07		3.00E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.83	0.76	0.82	0.76	.84	.75	0.83	0.75	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.7	0.83	0.7	0.82	0.69	0.84	0.68	0.83	0.67	0.83
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0.04		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	8.24E+07	7.00E+07	7.92E+07	6.69E+07	9.89E+07	8.14E+07	9.31E+07	7.59E+07	8.54E+07	6.87E+07
RDF FLOWRATE, AVERAGE	TPH	2.62		2.51		4.12		3.88		3.56	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	3585	5073	3444	4849	2866	5896	2699	5503	2476	4977
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1375	425	1337	406	1875	494	1796	461	1705	417
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.44	0.17	0.44	0.17	0.45	0.17	0.46	0.17	0.48	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.15	0.34	0.14	0.38	0.13	0.31	0.12	0.34	0.12	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	2	2	2	2	2	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.83	2.06	1.82	2.27	1.81	1.86	1.8	2.06	1.8	2.06
COMBUSTION AIR RATE, AVERAGE	LB/HR	80045	67977	82691	69848	88777	73061	90392	73736	82929	66683
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	17788	15106	18376	15522	19728	16236	20087	16386	18429	14818
WET FLUE GAS RATE, AVERAGE	LB/HR	87489	72625	89828	74290	98008	78463	99053	78778	90818	71243
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	22971	26798	22780	27378	29853	28994	27894	29069	22813	26288
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED I= YES	NONE	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.87	$0.74	$0.90	$0.76	$0.97	$0.80	$0.99	$0.81	$0.91	$0.73
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.79	$0.00	$1.83	$0.00	$2.29	$0.00	$2.24	$0.00	$1.85	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$3.20	$0.00	$3.10	$0.00	$4.71	$0.00	$4.48	$0.00	$4.16	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1429	618	1342	618	1732	618	1618	618	1618	618
ANNUAL LABOR COST, BURDENED	$/YR	$337,406	$243,638	$335,804	$242,482	$370,631	$244,790	$368,886	$243,638	$368,886	$243,638
OPERATORS PER SHIFT	MAN/SHIF	2.31	1.67	2.3	1.66	2.54	1.68	2.53	1.67	2.53	1.67
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$79.00	$112.00	$102.00	$143.00	$169.00	$348.00	$159.00	$325.00	$146.00	$294.00
RDF FUEL COST, AVERAGE	$/HR	$5.00		$5.00		$8.00		$8.00		$7.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$10.45	$3.23	$10.15	$3.09	$14.24	$3.75	$13.64	$3.50	$12.95	$3.17
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	7862	6290	7862	6290	7862	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$25,773		$25,086		$27,675		$26,904		$26,336	
AVAILABILITY, FRACTION	NONE	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	BTU	3.66E+11	4.57E+11	3.47E+11	4.34E+11	4.29E+11	5.36E+11	3.97E+11	4.96E+11	3.59E+11	4.49E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$36,923	$5,837	$36,684	$5,998	$50,126	$6,273	$48,429	$6,332	$43,524	$5,726
ANNUAL CONVENTIONAL FUEL COST	$/YR	$498,278	$681,564	$639,052	$1,124,586	$1,063,535	$2,735,165	$1,001,465	$2,552,894	$918,781	$2,308,704
ANNUAL RDF FUEL COST	$/YR	$32,925		$31,635		$51,825		$48,800		$44,771	
ANNUAL ASH DISPOSAL COST	$/YR	$65,710	$25,399	$63,848	$24,273	$89,558	$29,518	$85,818	$27,551	$81,473	$24,916
ANNUAL MSW DISPOSAL COST	$/YR	$0	$102,393	$0	$102,393	$0	$204,786	$0	$204,786	$0	$204,786
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	1.83		1.82		1.81		1.8		1.8	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$109,411		$106,911		$125,234		$122,331		$123,013	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,263		$92,743		$112,692		$109,540		$109,54	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$337,682		$328,249		$344,465		$334,267		$334,267	

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BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$542,356		$527,904		$582,391		$566,158		$566,845	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$715,910		$696,833		$768,756		$747,329		$748,236	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	0		0		0		0		0	
TOTAL ANNUAL O&M COST	$/YR	$997,014	$1,156,438	$1,132,109	$1,397,338	$1,653,350	$3,015,747	$1,580,302	$2,830,414	$1,484,372	$2,582,984
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$1,156,438	$0	$1,397,338	$0	$3,015,747	$0	$2,830,414	$0	$2,582,984
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0	$3	$0	$3	$0	$6	$0	$6	$0	$6
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.96		-0.19		9.42		8.73		7.42	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$2.72	$2.53	$3.26	$3.22	$3.86	$5.63	$3.98	$5.70	$4.13	$5.76
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	16463		15817		25912		24400		22386	
Avoided MSW disposal cost	$/YR	$28,577		$28,577		$79,773		$79,773		$79,773	
SIR w/disposal credit	NONE	-0.58		0.2		10.41		9.75		8.44	

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Summary of Sensitivity Analysis
Little Creek Amphibious Base

definition	UNITS	Best Case #4 RDF Cofiring	Best Case #4 Conventional Fuel	Best Case #5 RDF Cofiring	Best Case #5 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.71E+07	5.71E+07	5.71E+07	5.71E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.41E+07	8.45E+07	9.41E+07	6.45E+07
MAXIMUM TURNDOWN STEAM RATING, STEAM BTUH	BTUH	2.49E+07		2.80E+07	
BOILER EFFICIENCY AT MCR	NONE	0.75	.83	0.75	0.83
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.67	0.83	0.67	0.83
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	8.54E+07	6.87E+07	8.54E+07	6.87E+07
RDF FLOWRATE, AVERAGE	TPH	3.56		3.56	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2476	4977	2476	4977
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1705	417	1705	417
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.48	0.17	0.48	0.17
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.12	0.34	0.12	0.34
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	2	2	2
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.02	0.02	0.02
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.8	2.06	1.8	2.06
COMBUSTION AIR RATE, AVERAGE	LB/HR	82929	66683	82929	66683
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	18429	14818	18429	14818
WET FLUE GAS RATE, AVERAGE	LB/HR	90818	71243	90818	71243
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	22813	26288	22813	26288
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.91	$0.73	$0.91	$0.73
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.85	$0.00	$1.85	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$4.16	$0.00	$4.16	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1618	618	1618	618
ANNUAL LABOR COST, BURDENED	$/YR	$368,886	$243,638	$368,886	$243,638
OPERATORS PER SHIFT	MAN/SHIF	2.53	1.67	2.53	1.67
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$146.00	$294.00	$73.00	$147.00
RDF FUEL COST, AVERAGE	$/HR	$68.00		$68.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$12.95	$3.17	$12.95	$3.17
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	7862	6290	7862
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$26,936		$26,936	
AVAILABILITY, FRACTION	NONE	0.72	0.9	0.72	0.9
ANNUAL STEAM PRODUCTION, NET	BTU	3.59E+11	4.49E+11	3.59E+11	4.49E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$43,524	$5,726	$43,524	$5,726
ANNUAL CONVENTIONAL FUEL COST	$/YR	$918,781	$2,308,704	$459,390	$1,154,352
ANNUAL RDF FUEL COST	$/YR	$430,698		$430,698	
ANNUAL ASH DISPOSAL COST	$/YR	$81,473	$24,916	$81,473	$24,916
ANNUAL MSW DISPOSAL COST	$/YR	$0	$204,786	$0	$204,786
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	1.8		1.8	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$123,019		$123,019	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$109,540		$109,540	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$334,287		$334,287	

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BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$566,845		$566,845	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$748,236		$748,236	
CAPITAL RECOVERY FACTOR	NONE	9.5A	9.5A	9.5A	9.5A
ANNUALIZED COST OF CAPITAL	$/YR	0		0	
TOTAL ANNUAL O&M COST	$/YR	$1,870,299	$2,582,084	$1,4[illegible],909	$1,428,632
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$2,582,984	$0	$1,428,632
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$0	$6	$0	$3
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	2.5		-3.42	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$5.21	$5.76	$3.93	$3.18
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	22386		22386	
Avoided MSW disposal cost	$/YR	$79,773		$79,773	
SIR w/disposal credit	NONE	3.52		-2.4	

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	Sens A RDF COFIRING	Sens A CONVENTIONAL FUEL	Sens 1 Steam demand RDF COFIRING	Sens 1 Steam demand CONVENTIONAL FUEL	Sens 2 RDF COFIRING	Sens 2 CONVENTIONAL FUEL	SENS - 3 RDF moisture RDF COFIRING	SENS - 3 RDF moisture CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07	6.14E+07	6.14E+07	6.50E+07	6.50E+07	5.14E+07	5.14E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.67E+07	7.47E+07	8.67E+07	7.47E+07	8.67E+07	7.47E+07	8.88E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.98E+07		1.98E+07		1.98E+07		2.01E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82	0.76	0.82	0.76	0.82	0.77	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.77	0.82	0.77	0.82	0.76	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.75E+07	6.20E+07	8.00E+07	7.48E+07	8.44E+07	7.92E+07	6.74E+07	6.26E+07
RDF FLOWRATE, AVERAGE	TPH	2.14		2.54		2.68		1.87	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2749	4210	3260	5082	3438	5380	2745	4253
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	774	278	843	336	872	356	721	281
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.17	0.09	0.15	0.09	0.25	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29	0.74	0.29	0.74	0.29	0.8	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	8.11	1.28	8.11	1.28	8.11	1.28	8.21	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57618	52944	68325	63915	72063	67657	57531	53486
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12804	11765	15183	14203	16014	15035	12785	11886
WET FLUE GAS RATE, AVERAGE	LB/HR	63875	56876	75821	68662	79986	72681	63297	57458
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20019	23192	29175	27997	32691	29636	19708	23429
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.60	$1.47	$1.90	$1.78	$2.00	$1.88	$1.60	$1.49
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.13	$0.00	$4.48	$0.00	$5.01	$0.00	$3.08	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.88	$0.00	$7.95	$0.00	$8.32	$0.00	$6.14	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409	1257	409	1257	409	1161	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$75	$115	$89	$139	$94	$147	$75	$117
RDF FUEL COST, AVERAGE	$/HR	$4		$5		$5		$4	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0	$0	$0	$0	$0	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$32,809		$32,764		$32,754		$32,750	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.200E+11	4.220E+11	3.860E+11	5.100E+11	4.090E+11	5.400E+11	3.230E+11	4.270E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$73,041	$12,225	$90,182	$14,758	$96,442	$15,622	$68,002	$12,350
ANNUAL CONVENTIONAL FUEL COST	$/YR	$473,769	$957,346	$561,814	$1,155,735	$592,547	$1,223,386	$473,055	$967,151
ANNUAL RDF FUEL COST	$/YR	$26,941		$31,947		$33,695		$23,538	
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	$0	$94,000	$0	$94,000	$0	$94,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	8.11		8.11		8.11		8.21	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$106,769		$106,027		$105,878		$101,829	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,391		$95,391		$95,391		$96,229	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	

RDF Cost & Summary

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$338,165		$338,165		$339,165		$341,305	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$540,326		$539,584		$539,434		$539,364	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$713,230		$712,251		$712,053		$711,960	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$920,615	$1,196,348	$1,030,763	$1,397,270	$1,069,495	$1,465,785	$911,400	$1,206,279
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$1,196,348	$0	$1,397,270	$0	$1,465,785	$0	$1,206,279
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$2.83	$0.00	$2.74	$0.00	$2.72	$0.00	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.19		0.38		0.55		0.04	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$2.88	$2.83	$2.67	$2.74	$2.62	$2.72	$2.82	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	13470		15974		16848		11769	
Avoided MSW disposal cost									
SIR w/disposal credit			Sens A		Sens 1		Sens 2		SENS - 3

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	Sens 4 RDF COFIRING	Sens 4 CONVENTIONAL FUEL	Sens 5 Excess air RDF COFIRING	Sens 5 Excess air CONVENTIONAL FUEL	Sens 6 RDF COFIRING	Sens 6 CONVENTIONAL FUEL	SENS 7 RDF percent ash RDF COFIRING	SENS 7 RDF percent ash CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.02E+07	5.02E+07	4.76E+07	4.76E+07	4.91E+07	4.91E+07	5.07E+07	5.07E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.40E+07	7.47E+07	7.37E+07	7.31E+07	7.98E+07	7.39E+07	8.61E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.95E+07		1.94E+07		1.96E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.74	0.8	0.75	0.81	0.76	0.82
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.74	0.82	0.73	0.8	0.74	0.81	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.76E+07	6.12E+07	6.49E+07	5.92E+07	6.61E+07	6.05E+07	6.75E+07	6.18E+07
RDF FLOWRATE, AVERAGE	TPH	2.5		2.06		2.1		2.5	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2756	4154	2644	4020	2694	4110	2751	4197
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	847	275	762	266	768	272	1346	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.21	0.09	0.25	0.09	0.24	0.09	0.13	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.66	0.29	0.71	0.35	0.73	0.32	0.41	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	7.98	1.28	7.92	1.57	8.02	1.42	8.08	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57755	52241	64879	59196	61288	56111	57652	52781
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12835	11609	14417	13155	13620	12469	12812	11729
WET FLUE GAS RATE, AVERAGE	LB/HR	64673	56120	70879	62950	67411	59949	64057	56700
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20455	22883	21122	25582	20540	24401	20119	23120
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONATOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.61	$1.45	$1.80	$1.65	$1.71	$1.56	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.20	$0.00	$3.57	$0.00	$3.34	$0.00	$3.14	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$7.86	$0.00	$6.66	$0.00	$6.76	$0.00	$7.85	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1356	409	1100	409	1171	409	2214	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$310,219	$224,007	$312,141	$225,395	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.12	1.53	2.14	1.54	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$76	$114	$72	$110	$74	$113	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$5		$4		$4		$5	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0	$0	$0	$0.00	$0.00	$0.00	$0.00
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$32,849		$30,891		$31,812		$33,127	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.160E+11	4.170E+11	2.990E+11	3.950E+11	3.090E+11	4.080E+11	3.190E+11	4.210E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$79,687	$12,063	$75,647	$13,669	$74,302	$12,956	$79,237	$12,188
ANNUAL CONVENTIONAL FUEL COST	$/YR	$474,903	$944,628	$455,595	$914,136	$464,270	$934,717	$474,055	$954,399
ANNUAL RDF FUEL COST	$/YR	$31,506		$25,907		$26,401		$31,450	
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	$0	$94,000	0	$94,000	$0	$94,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	7.98		7.92		8.02		8.08	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$112,683		$101,348		$103,948		$113,227	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$94,286		$89,874		$92,526		$95,137	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$334,023		$317,526		$327,439		$337,212	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$540,992		$508,748		523913		545577	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$714,109		$671,548		$691,566		$720,161	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$933,001	$1,183,468	$898,259	$1,151,812	$908,926	$1,173,069	$931,926	$1,193,363
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$1,183,468	$0	$1,151,812	$0	$1,173,069	$0	$1,193,363
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$2.84	$0.00	$2.92	$0.00	$2.88	$0.00	$2.84
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.48		-0.36		(0.27)		-0.36	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$2.96	$2.84	$3.00	$2.92	$2.94	$2.88	$2.92	$2.84
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RBF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	15753		12954		13200		15725	
Avoided MSW disposal cost									
SIR w/disposal credit			Sens 4		Sens 5		Sens 6		SENS 7

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	SENS 8 RDF COFIRING	SENS 8 CONVENTIONAL FUEL	SENS - 9 RDF HHV COFIRING	SENS - 9 RDF HHV CONVENTIONAL FUEL	SENS - 10 RDF COFIRING	SENS - 10 CONVENTIONAL FUEL	SENS - 11 RDF cost COFIRING	SENS - 11 RDF cost CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.05E+07	5.05E+07	5.05E+07	5.05E+07	4.99E+07	4.99E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.52E+07	7.47E+07	8.50E+07	7.47E+07	8.29E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.96E+07		1.96E+07		1.94E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82	0.74	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.76E+07	6.15E+07	6.75E+07	6.15E+07	6.76E+07	6.08E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	3		2.41		2.76		2.14	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2753	4179	2751	4176	2754	4132	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	2147	276	828	276	897	273	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.08	0.09	0.22	0.09	0.2	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.26	0.29	0.68	0.29	0.62	0.29	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	8.04	1.28	8.04	1.28	7.95	1.28	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57703	52555	57654	52512	57716	51969	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12823	11679	12812	11669	12826	11549	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	64314	56457	64399	56411	65088	55828	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20261	23021	20264	23002	20591	22765	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.61	$1.46	$1.60	$1.46	$1.61	$1.45	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.17	$0.00	$3.17	$0.00	$3.23	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$9.17	$0.00	$7.61	$0.00	$8.53	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	3543	409	1334	409	1430	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$75	$115	$75	$114	$75	$113	$75	$115
RDF FUEL COST, AVERAGE	$/HR	$6		$5		$6		$65	
ASH DISPOSAL COST, AVERAGE	$/HR	$0.00	$0.00	$0	$0	$0	$0	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$53,254		$32,891		$32,967		$32,809	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.180E+11	4.190E+11	3.17E+11	4.19E+11	3.140E+11	4.140E+11	3.200E+11	4.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$87,715	$12,135	$77,914	$12,125	$84,102	$12,000	$73,041	$12,226
ANNUAL CONVENTIONAL FUEL COST	$/YR	$474,474	$950,308	$474,073	$949,532	$474,576	$939,721	$473,769	$957,346
ANNUAL RDF FUEL COST	$/YR	$37,773		$30,328		$34,697		$408,288	
ANNUAL ASH DISPOSAL COST	$/YR	$0	$0	$0	$0	$0	$0	$0	$0
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	0	$94,000	$0	$94,000	$0	$94,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	8.04		8.04		7.95		8.11	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$121,336		$111,331		$116,671		$106,769	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$94,782		$94,715		93853		$95,391	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$325,041		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		0		0		0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$335,883		$335,630		$332,403		$338,165	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	877042		541675		$542,927		540326	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$1,157,695		$715,011		$716,664		$713,230	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	$10	$10	$10
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		0		$0	
TOTAL ANNUAL O&M COST	$/YR	$967,272	$1,189,220	$929,261	$1,188,434	$940,397	$1,178,498	$1,301,962	$1,196,349
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	1189220	0	1188434	0	1178498	0	1196349
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$2.84	$0.00	$2.84	$0.00	$2.84	$0.00	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-0.54		-0.38		-0.63		-5.29	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$3.05	$2.84	$2.93	$2.84	2.99	2.84	$4.07	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	18887		15164		17349		13470	
Avoided MSW disposal cost									
SIR w/disposal credit		SENS 8		SENS - 9				SENS - 11	

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Summary of Sensitivity Analysis — Cherry Point

variable definition	UNITS	Sens 12 RDF COFIRING	Sens 12 CONVENTIONAL FUEL	Sens 13 Cofire ratio RDF COFIRING	Sens 13 Cofire ratio CONVENTIONAL FUEL	Sens 14 RDF COFIRING	Sens 14 CONVENTIONAL FUEL	Sens 15 conventional fuel cost RDF COFIRING	Sens 15 conventional fuel cost CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07	5.24E+07	5.24E+07	4.94E+07	4.94E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.67E+07	7.47E+07	9.27E+07	7.47E+07	8.10E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.98E+07		2.08E+07		1.89E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82	0.79	0.82	0.73	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.78	0.82	0.73	0.82	0.75	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.75E+07	6.20E+07	6.75E+07	6.38E+07	6.74E+07	6.02E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.14		1.07		3.21		2.14	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2749	4210	3670	4334	1831	4092	2749	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	774	278	596	287	950	271	774	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.27	0.09	0.21	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29	1.12	0.29	0.53	0.29	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	8.11	1.28	8.47	1.28	7.76	1.28	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57618	52944	57691	54502	57572	51459	57618	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12804	11765	12820	12111	12794	11435	12804	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	63875	56876	62909	58549	64873	55280	63875	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20019	23192	19357	23874	20763	22541	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.60	$1.47	$1.60	$1.52	$1.60	$1.43	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.13	$0.00	$3.03	$0.00	$3.24	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.88	$0.00	$3.82	$0.00	$9.71	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409	882	409	1615	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$269,637	$226,777	$343,357	$226,777	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	1.85	1.55	2.35	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$75	$115	$101	$119	$50	$112	$113	$173
RDF FUEL COST, AVERAGE	$/HR	$32		$2		6		4	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0	$0	$0	$0	$0	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$32,809		$30,697		34029		32809	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.200E+11	4.220E+11	3.290E+11	4.350E+11	3.110E+11	4.100E+11	3.200E+11	4.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$73,041	$12,225	$53,188	$12,585	$91,479	$11,882	$73,041	$12,225
ANNUAL CONVENTIONAL FUEL COST	$/YR	$473,769	$957,346	$632,493	$985,512	$315,598	$930,497	$710,654	$1,436,019
ANNUAL RDF FUEL COST	$/YR	$202,056		$13,487		40379		26941	
ANNUAL ASH DISPOSAL COST	$/YR	0	0	0	0	0	0	0	0
ANNUAL NOx DISPOSAL COST	$/YR	$0	$94,000	$0	$94,000	$0	$94,000	$0	$94,000
FURNACE COLD [illegible] & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	8.11		8.47		7.76		8.11	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$106,769		$82,729		$123,104		$106,769	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,391		$75,754		$106,001		$95,391	
BARE INCREMENTAL COST OF RDF HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	0		0		0		0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	338165		347066		329324		338165	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	540326		505549		560428		540326	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$713,230		$667,325		$739,765		$713,230	
CAPITAL RECOVERY FACTOR	NONE	$10	$10	$10	$10	$10	$10	$10	$10
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$1,095,730	$1,196,348	$999,502	$1,224,874	$824,843	$1,169,156	$1,157,500	$1,675,021
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	1196348	0	1224874	0	1169156	0	1675021
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$2.83	$0.00	$2.82	$0.00	$2.85	$0.00	$3.97
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.53		-1.02		0.79		1.5	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$3.42	$2.83	$3.03	$2.82	$2.65	$2.85	$3.62	$3.97
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	13470		6744		$20,190		$13,470	
Avoided MSW disposal cost									
SIR w/disposal credit		Sens 12		Sens 13		Sens 14		Sens 15	

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	Sens 16 RDF COFIRING	Sens 16 CONVENTIONAL FUEL	Sens 17 MSW disposal cost (no credit) RDF COFIRING	Sens 17 CONVENTIONAL FUEL	Sens 18 RDF COFIRING	Sens 18 CONVENTIONAL FUEL	Sens 19 Ash disposal cost RDF COFIRING	Sens 19 CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.67E+07	7.47E+07	8.67E+07	7.47E+07	8.67E+07	7.47E+07	8.67E+07	7.47E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.98E+07		1.98E+07		1.98E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82	0.76	0.82	0.76	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.75	0.82	0.75	0.82	0.75	0.82	0.7	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.75E+07	6.20E+07	6.75E+07	6.20E+07	6.75E+07	6.20E+07	7.29E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.14		2.14		2.14		2.31	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2749	4210	2749	4210	2749	4210	2969	4210
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	774	278	774	278	774	278	1120	278
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.23	0.09	0.23	0.09	0.43	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29	0.74	0.29	0.74	0.29	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	8.11	1.28	8.11	1.28	8.11	1.28	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57618	52944	57618	52944	57618	52944	62231	52944
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12804	11765	12804	11765	12804	11765	13829	11765
WET FLUE GAS RATE, AVERAGE	LB/HR	63875	56876	63875	56876	63875	56876	68706	56876
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20019	23192	20019	23192	20019	23192	20019	23192
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEN, AVERAGE	$/HR	$1.60	$1.47	$1.60	$1.47	$1.60	$1.47	$1.73	$1.47
ELECTRIC POWER COST FOR ID SYSTEN, AVERAGE	$/HR	$3.13	$0.00	$3.13	$0.00	$3.13	$0.00	$3.36	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.88	$0.00	$6.88	$0.00	$6.88	$0.00	$7.35	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409	1257	409	1257	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777	$314,056	$226,777
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$151	$231	$75	$115	$75	$115	$81	$115
RDF FUEL COST, AVERAGE	$/HR	4		4		4		5	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0	$0	$0	$0	$0	$5	$1
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	32809		32809		32809		33006	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.200E+11	4.220E+11	3.200E+11	4.220E+11	3.200E+11	4.220E+11	3.200E+11	4.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$73,041	$12,226	$73,041	$12,225	$73,041	$12,225	$78,265	$12,225
ANNUAL CONVENTIONAL FUEL COST	$/YR	$947,539	$1,914,691	$473,769	$957,346	$473,769	$957,346	$511,701	$957,346
ANNUAL RDF FUEL COST	$/YR	26941		26941		26941		29098	
ANNUAL ASH DISPOSAL COST	$/YR	0	0	0	0	0	0	33104	10861
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	$0	$141,000	$0	$188,000	$0	$94,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	8.11		8.11		8.11		8.11	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$106,769		106769		106769		110025	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		0		0		0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		0		0		0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,391		$95,391		$95,391		$95,391	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	0		0		0		0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	338165		338165		338165		338165	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	540326		540326		540326		543582	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$713,230		$713,230		$713,230		$717,528	
CAPITAL RECOVERY FACTOR	NONE	$10	$10	$10	$10	$10	$10	$10	$10
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$1,394,385	$2,153,694	$920,615	$1,196,348	$920,615	$1,196,348	$999,229	$1,207,209
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	2153694	0	1196348	0	1196348	0	1207209
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$5.10	$0.00	$2.83	$0.00	$2.83	$0.00	$2.86
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	3.18		-0.19		-0.19		-1.12	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$4.36	$5.10	$2.88	$2.83	$2.88	$2.83	$3.12	$2.86
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	$13,470		$13,470		$13,470		$14,549	
Avoided MSW disposal cost									
SIR w/disposal credit		Sens 16		Sens 17		Sens 18		Sens 19	

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	Sens 20 RDF COFIRING	Sens 20 CONVENTIONAL FUEL	Sens 21:SIR w/credit Actual MSW $ RDF COFIRING	Sens 21:SIR w/credit Actual MSW $ CONVENTIONAL FUEL	Sens 22:SIR w/credit MSW +50% RDF COFIRING	Sens 22:SIR w/credit MSW +50% CONVENTIONAL FUEL	Sens 23:SIR w/credit MSW +100% RDF COFIRING	Sens 23:SIR w/credit MSW +100% CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07	5.09E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.67E+07	7.47E+07	8.66E+07	7.46E+07	8.66E+07	7.46E+07	8.66E+07	7.46E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.98E+07		1.98E+07		1.98E+07		1.98E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82	0.76	0.82	0.76	0.82	0.76	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.69	0.82	0.75	0.82	0.75	0.82	0.75	0.82
MAXIMUN STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	7.41E+07	6.20E+07	6.75E+07	6.20E+07	6.75E+07	6.20E+07	6.75E+07	6.20E+07
RDF FLOWRATE, AVERAGE	TPH	2.35		2.14		2.14		2.14	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	3019	4210	2749	4212	2749	4212	2749	4212
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1197	278	774	279	774	279	774	279
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.46	0.09	0.23	0.09	0.23	0.09	0.23	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29	0.74	0.29	0.74	0.29	0.74	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMB	8.11	1.28	8.11	1.28	8.11	1.28	8.11	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	63267	52944	57628	52966	57628	52966	57628	52966
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	14059	11765	12806	11770	12806	11770	12806	11770
WET FLUE GAS RATE, AVERAGE	LB/HR	69791	56876	63887	56899	63887	56899	63887	56899
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20019	23192	20027	23201	20027	23201	20027	23201
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONATOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.76	$1.47	$1.60	$1.47	$1.60	$1.47	$1.60	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.42	$0.00	$3.13	$0.00	$3.13	$0.00	$3.13	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$7.45	$0.00	$6.88	$0.00	$6.88	$0.00	$6.88	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409	1257	409	1257	409	1257	409
ANNUAL LABOR COST, BURDENED	$/YR	$314,056	$226,777	$313,953	$226,703	$313,953	$226,703	$313,953	$226,703
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.15	1.55	2.15	1.55	2.15	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$83	$115	$75	$115	$75	$115	$75	$115
RDF FUEL COST, AVERAGE	$/HR	5		4		$4		$4	
ASH DISPOSAL COST, AVERAGE	$/HR	$9	$2	$0	$0	$0	$0	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	33049		32805		32805		32805	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.200E+11	4.220E+11	3.200E+11	4.220E+11	3.200E+11	4.220E+11	3.200E+11	4.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$79,433	$12,225	$73,058	$12,230	$73,058	$12,230	$73,058	$12,230
ANNUAL CONVENTIONAL FUEL COST	$/YR	$520,220	$957,346	$473,858	$957,736	$473,858	$957,736	$473,858	$957,736
ANNUAL RDF FUEL COST	$/YR	29582		26946		26946		26946	
ANNUAL ASH DISPOSAL COST	$/YR	55732	17100	0	0	0	0	0	0
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	$0	$94,000	$0	$141,000	$0	$188,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	8.11		8.11		8.11		8.11	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	110736		106768		106768		106768	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	0		0		0		0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	0		0		0		0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,391		$95,379		$95,379		$95,379	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	0		0		0		0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	338165		338117		338117		338117	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	544292		540264		540264		540264	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$718,466		$713,149		$713,149		$713,149	
CAPITAL RECOVERY FACTOR	NONE	910	910	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	90		90		0		0	
TOTAL ANNUAL O&M COST	$/YR	$1,032,073	$1,213,448	$920,620	$1,196,669	$920,620	$1,196,669	$920,620	$1,196,669
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	1213448	0	1196669	0	1196669	0	1196669
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	90.00	$2.87	90.00	$2.83	90.00	$2.83	90.00	$2.83
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-1.49		-0.18		-0.18		-0.18	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$3.23	$2.87	$2.88	$2.83	$2.88	$2.83	$2.88	$2.83
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	90		90		90		90	
TONS PER YEAR RDF REQUIRED	TPY	$14,791		$13,473		$13,473		$13,473	
Avoided MSW disposal cost				$17,000		$40,500		$64,000	
SIR w/disposal credit		Sens 20		0.04		0.36		0.67	

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Summary of Sensitivity Analysis Cherry Point

variable definition	UNITS	Conventional Fuel Cost -25% RDF COFIRING	Conventional Fuel Cost -25% CONVENTIONAL FUEL	Best Case 01 RDF COFIRING	Best Case 01 CONVENTIONAL FUEL	Best Case 02 RDF COFIRING	Best Case 02 CONVENTIONAL FUEL	Best Case 03 RDF COFIRING	Best Case 03 CONVENTIONAL FUEL	Best Case 04 RDF COFIRING	Best Case 04 CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	5.09E+07	5.09E+07	6.29E+07	6.29E+07	5.02E+07	5.02E+07	5.02E+07	5.02E+07	5.02E+07	5.02E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.66E+07	7.46E+07	8.39E+07	7.46E+07	8.39E+07	7.46E+07	8.39E+07	7.46E+07	8.39E+07	7.46E+07
MAXIMUM TURNDOWN STEAM RATING, STEAM BTUH	BTUH	1.98E+07		1.92E+07		1.92E+07		1.92E+07		1.92E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.82	0.74	0.82	0.74	0.82	0.74	0.82	0.74	0.82
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.75	0.82	0.77	0.82	0.75	0.82	0.75	0.82	0.66	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08
DERATE	NONE	0		0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	6.75E+07	6.20E+07	8.18E+07	7.67E+07	6.72E+07	6.12E+07	6.72E+07	6.12E+07	7.57E+07	6.12E+07
RDF FLOWRATE, AVERAGE	TPH	2.14		3.41		2.8		2.8		3.16	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2749	4212	2222	5212	1826	4155	1826	4155	2058	4155
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	774	279	926	345	869	275	869	275	1421	275
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.23	0.09	0.12	0.09	0.23	0.09	0.23	0.09	0.47	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.74	0.29	0.59	0.29	0.59	0.29	0.59	0.29	0.59	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	2	0	2	0	2	0	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMB	8.11	1.28	7.9	1.28	7.9	1.28	7.9	1.28	7.9	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	57628	52966	69852	65541	57421	52256	57421	52256	64687	52256
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	12806	11770	15523	14565	12760	11612	12760	11612	14375	11612
WET FLUE GAS RATE, AVERAGE	LB/HR	63887	56899	77963	70408	63980	56136	63980	56136	71635	56136
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	20027	23201	31864	28709	20256	22890	20256	22890	20256	22890
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.60	$1.47	$1.94	$1.82	$1.60	$1.45	$1.60	$1.45	$1.80	$1.45
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$3.13	$0.00	$4.82	$0.00	$3.15	$0.00	$3.15	$0.00	$3.53	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$6.88	$0.00	$10.21	$0.00	$8.65	$0.00	$8.65	$0.00	$9.57	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1257	409	1509	409	1509	409	1509	409	1509	409
ANNUAL LABOR COST, BURDENED	$/YR	$313,953	$226,703	$343,245	$226,703	$343,245	$226,703	$343,245	$226,703	$343,245	$226,703
OPERATORS PER SHIFT	MAN/SH	2.15	1.55	2.35	1.55	2.35	1.55	2.35	1.55	2.35	1.55
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$57	$87	$122	$286	$100	$228	$50	$114	$56	$114
RDF FUEL COST, AVERAGE	$/HR	$4		$7		$6		$6		$6	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0	$0	$0	$0	$0	$0	$0	$7	$1
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299	6290	8299	6290	8299	6290	8299	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	32805		33983		34068		34068		34408	
AVAILABILITY, FRACTION	NONE	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.200E+11	4.220E+11	3.960E+11	5.220E+11	3.160E+11	4.160E+11	3.160E+11	4.160E+11	3.160E+11	4.160E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$73,058	$12,230	$106,758	$15,134	$84,252	$12,067	$84,252	$12,066	$93,692	$12,066
ANNUAL CONVENTIONAL FUEL COST	$/YR	$356,258	$720,050	$765,823	$2,370,239	$629,533	$1,889,800	$314,766	$944,900	$354,600	$944,900
ANNUAL RDF FUEL COST	$/YR	26946		42868		35239		35239		39698	
ANNUAL ASH DISPOSAL COST	$/YR	0	0	0	0	0	0	0	0	42015	10720
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000	$0	$188,000	$0	$188,000	$0	$188,000	$0	$188,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMB	8.11		7.9		7.9		7.9		7.9	
INCLUDED IN CAPITAL COST											
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	106768		116301		117695		117695		123294	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	0		0		0		0		0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	0		0		0		0		0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$95,379		$109,431		$109,431		$109,431		$109,431	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	0		0		0		0		0	

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	338117		333937		333937		333937		333937	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	540264		539679		561064		561064		566663	
BLENDED TOTAL INCREMENTAL CAPITAL COSTS	$	$713,149		$738,765		$740,604		$740,604		$747,995	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	0		0		0		0		0	
TOTAL ANNUAL O&M COST	$/YR	$803,020	$958,983	$1,292,678	$2,612,076	$1,126,337	$2,128,569	$811,571	$1,183,669	$907,659	$1,194,389
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	958983	0	2612076	0	2128569	0	1183669	0	1194389
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$2.27	$0.00	$5.00	$0.00	$5.11	$0.00	$2.84	$0.00	$2.87
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-1.02		8.87		6.27		1.1		-0.03	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$2.51	$2.27	$3.27	$5.00	$3.57	$5.11	$2.57	$2.84	$2.88	$2.87
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0		$0		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	$13,473		$21,434		$17,619		$17,619		$19,849	
Avoided MSW disposal cost		$17,000		$64,000		$64,000		$64,000		$64,000	
SIR w/disposal credit		-0.79		9.7		7.1		1.93		0.79	

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Summary of Sensitivity Analysis Cherry Point Best Case #5

variable definition	UNITS	RDF COFIRING	CONVENTIONAL FUEL
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.29E+07	6.29E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	8.39E+07	7.46E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.92E+07	
BOILER EFFICIENCY AT MCR	NONE	0.74	0.82
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.77	0.82
MAXIMUM STEAM DEMAND (MSD)	BTUH	2.25E+08	2.25E+08
DERATE	NONE	0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	8.18E+07	7.67E+07
RDF FLOWRATE, AVERAGE	TPH	3.41	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	2222	5212
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	926	345
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.12	0.09
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.59	0.29
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMB	0.02	0
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMB	7.9	1.28
COMBUSTION AIR RATE, AVERAGE	LB/HR	69852	65541
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	15523	14565
WET FLUE GAS RATE, AVERAGE	LB/HR	77963	70408
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	31864	28709
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.94	$1.82
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$4.82	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$10.21	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1509	409
ANNUAL LABOR COST, BURDENED	$/YR	$343,245	$226,703
OPERATORS PER SHIFT	MAN/SH	2.35	1.55
CONVENTIONAL FUEL COST, AVERGAE	$/HR	$122	$286
RDF FUEL COST, AVERAGE	$/HR	$7	
ASH DISPOSAL COST, AVERAGE	$/HR	$0	$0
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8299
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	33983	
AVAILABILITY, FRACTION	NONE	0.72	0.95
ANNUAL STEAM PRODUCTION, NET	BTU	3.960E+11	5.220E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$106,758	$15,134
ANNUAL CONVENTIONAL FUEL COST	$/YR	$765,823	$2,370,239
ANNUAL RDF FUEL COST	$/YR	42868	
ANNUAL ASH DISPOSAL COST	$/YR	0	0
ANNUAL MSW DISPOSAL COST	$/YR	$0	$94,000
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMB	7.9	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	116301	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$109,431	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	0	

Project Summary

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BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	333937	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	559670	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$738,765	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	0	
TOTAL ANNUAL O&M COST	$/YR	$1,292,678	$2,612,076
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	2612076
TOTAL COST PER MILLION BTU OF STEAM, (inc. cost of capital)	$/MMBT	$0.00	$5.00
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	8.87	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBT	$3.27	$5.00
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0	
TONS PER YEAR RDF REQUIRED	TPY	$21,434	
Avoided MSW disposal cost		$17,000	
SIR w/disposal credit		9.09	

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Budget

Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	0 Baseline RDF Cofiring	0 Baseline Conventional Fuel	1 Steam demand RDF Cofiring	1 Steam demand Conventional Fuel	2 RDF Cofiring	2 Conventional Fuel	3 RDF Moisture RDF Cofiring	3 RDF Moisture Conventional Fuel	4 RDF Cofiring	4 Conventional Fuel	5 Excess Air RDF Cofiring	5 Excess Air Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.82E+07	6.82E+07	7.94E+07	7.94E+07	1.07E+08	1.07E+08	6.84E+07	6.84E+07	6.79E+07	6.79E+07	6.70E+07	6.70E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.42E+08	1.38E+08	1.42E+08	1.38E+08	1.42E+08	1.38E+08	1.45E+08	1.38E+08	1.38E+08	1.38E+08	1.32E+08	1.37E+08
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.20E+07		3.20E+07		3.20E+07		3.24E+07		3.15E+07		3.17E+07	
BOILER EFFICIENCY AT MCR	NONE	0.77	0.8	0.77	0.8	0.77	0.8	0.78	0.8	0.76	0.8	0.76	0.8
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.68	0.8	0.7	0.8	0.72	0.8	0.69	0.8	0.67	0.8	0.68	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0		0		0		0		0.04	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	9.99E+07	8.51E+07	1.14E+08	9.91E+07	1.49E+08	1.33E+08	9.91E+07	8.54E+07	1.01E+06	8.47E+07	9.90E+07	8.43E+07
RDF FLOWRATE, AVERAGE	TPH	3.17		3.61		4.72		2.75		3.74		3.14	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	5709	8107	6502	9437	8500	12686	5662	8129	5767	8065	5660	8086
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1949	805	2100	937	2540	1260	1861	807	2066	801	1932	797
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.47	0.3	0.44	0.3	0.39	0.3	0.49	0.3	0.44	0.3	0.47	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.26	0.37	2.26	0.37	2.26	0.37	2.43	0.37	2.06	0.37	2.24	0.4
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	3	0	3	0	3	0	3	0	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMBTU	30.71	3.43	30.71	3.43	30.71	3.43	31.05	3.43	30.25	3.43	30.47	3.78
COMBUSTION AIR RATE, AVERAGE	LB/HR	94819	80778	107984	94032	141156	126407	94037	81000	95768	80365	101229	86127
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	21071	17951	23996	20896	31368	28091	20897	18000	21282	17859	22495	19139
WET FLUE GAS RATE, AVERAGE	LB/HR	104924	88080	119611	102531	156559	137833	103343	88321	106944	87629	111246	93356
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	17437	30981	23628	36064	42700	48481	16910	31066	18118	30823	18593	32777
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.12	$0.95	$1.27	$1.11	$1.67	$1.49	$1.11	$0.96	$1.13	$0.95	$1.19	$1.02
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.63	$0.00	$2.16	$0.00	$3.80	$0.00	$1.58	$0.00	$1.69	$0.00	$1.78	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$4.08	$0.00	$4.55	$0.00	$5.72	$0.00	$3.61	$0.00	$4.69	$0.00	$4.05	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2520	1635	2520	1635	2520	1635	2399	1635	2679	1635	2365	1635
ANNUAL LABOR COST, BURDENED	$/YR	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048	$455,067	$328,600
OPERATORS PER SHIFT	MAN/SHIFT	3.08	2.22	3.08	2.22	3.08	2.22	3.08	2.22	3.08	2.22	3.06	2.21
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$223	$316	$254	$368	$331	$495	$221	$317	$225	$315	$221	$313
RDF FUEL COST, AVERAGE	$/HR	$6.00		$7.00		$9.00		$6.00		$7.00		$6.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$15.59	$6.44	$16.80	$7.50	$20.32	$10.08	$14.89	$6.46	$16.53	$6.41	$15.45	$6.38
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$40,030		$39,960		$39,872		$39,916		$40,134		$38,965	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.290E+11	5.840E+11	4.990E+11	6.800E+11	6.710E+11	9.140E+11	4.300E+11	5.860E+11	4.270E+11	5.810E+11	4.220E+11	5.740E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$42,934	$8,164	$50,260	$9,504	$70,378	$12,775	$39,656	$8,186	$47,243	$8,122	$44,193	$8,705
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,400,561	$2,706,711	$1,595,015	$3,150,820	$2,084,989	$4,235,650	$1,389,012	$2,714,128	$1,414,574	$2,692,859	$1,388,434	$2,679,793
ANNUAL RDF FUEL COST	$/YR	$39,902		$45,442		$59,401		$34,626		$47,018		$39,357	
ANNUAL ASH DISPOSAL COST	$/YR	$98,056	$55,149	$105,659	$64,198	$127,827	$86,301	$93,661	$55,300	$103,957	$54,867	$97,202	$54,600
ANNUAL MSW DISPOSAL COST	$/YR	$672,000		$672,000		$672,000		$672,000		$672,000		$672,000	
FURNACE COLD (NOKING CO & SMOKE) IF = 1	NONE	0		0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	30.71		30.71		30.71		31.05		30.25		30.47	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$134,675		$133,529		$132,079		$128,381		$142,239		$131,412	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	A Baseline RDF Cofiring	A Baseline Conventional Fuel	1 Steam demand RDF Cofiring	1 Steam demand Conventional Fuel	2 RDF Cofiring	2 Conventional Fuel	3 RDF Moisture RDF Cofiring	3 RDF Moisture Conventional Fuel	4 RDF Cofiring	4 Conventional Fuel	5 Excess Air RDF Cofiring	5 Excess Air Conventional Fuel
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$114,463		$114,463		$114,463		$115,406		$113,263		$111,499	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$410,093		$410,093		$410,093		$413,590		$405,474		$398,801	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	679252.00		658105		636635		657377		660976		641711	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$870,212		$868,699		$866,785		$867,737		$872,489		$847,059	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$2,078,335	$3,100,072	$2,293,409	$3,354,569	$2,839,539	$4,664,775	$2,053,943	$3,107,663	$2,109,998	$3,085,896	$2,063,418	$3,071,698
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$3,100,072	$0	$3,354,569	$0	$4,664,775	$0	$3,107,663	$0	$3,085,896	$0	$3,071,698
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$5.31	$0.00	$5.23	$0.00	$5.11	$0.00	$5.31	$0.00	$5.31	$0.00	$5.35
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	2.18		3.49		6.47		2.52		1.72		.8	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.85	$5.31	$4.59	$5.23	$4.23	$5.11	$4.77	$5.31	$4.94	$5.31	$4.90	$5.35
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0		$0		$0		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	19951		22721		29701		17313		23509		19778	
Avoided MSW disposal cost	$/YR	$210,000		$210,000		$210,000		$210,000		$210,000		$210,000	
SIR w/disposal credit	NONE	4.48		5.8		8.78		4.83		4.01		4.54	

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Summary of Sensitivity Analysis
PUBS' SOUND

definition	UNITS	6 RDF Cofiring	6 Conventional Fuel	7 Percent Ash RDF Cofiring	7 Conventional Fuel	8 RDF Cofiring	8 Conventional Fuel	9 RDF HHV RDF Cofiring	9 Conventional Fuel	10 RDF Cofiring	10 Conventional Fuel	11 RDF Cost RDF Cofiring	11 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.50E+07	6.50E+07	6.81E+07	6.81E+07	6.80E+07	6.80E+07	6.80E+07	6.80E+07	6.77E+07	6.77E+07	6.82E+07	6.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.24E+08	1.38E+08	1.41E+08	1.38E+08	1.40E+08	1.38E+08	1.40E+08	1.38E+08	1.37E+08	1.38E+08	1.42E+08	1.38E+08
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.15E+07		3.19E+07		3.17E+07		3.17E+07		3.14E+07		3.20E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.79	0.76	0.8	0.76	0.8	0.76	0.8	0.75	0.8	0.77	0.8
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.67	0.79	0.68	0.8	0.68	0.8	0.68	0.8	0.67	0.8	0.68	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0.09		0		0		0		0.01		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	9.71E+07	8.24E+07	1.00E+08	8.50E+07	1.01E+08	8.49E+07	1.01E+08	8.49E+07	1.01E+08	8.45E+07	9.99E+07	8.51E+07
RDF FLOWRATE, AVERAGE	TPH	3.08		3.71		4.48		3.59		4.12		3.17	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	5350	7845	5728	8099	5754	8088	5743	8088	5775	8043	5709	8107
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1903	779	2801	804	4003	803	2034	803	2143	799	1949	805
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.47	0.3	0.33	0.3	0.23	0.3	0.45	0.3	0.43	0.3	0.47	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.22	0.44	1.39	0.37	0.9	0.37	2.12	0.37	1.95	0.37	2.26	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	0	3	0	3	0	3	0	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMBTU	30.22	4.13	30.58	3.43	30.4	3.43	30.45	3.43	30.13	3.43	30.71	3.43
COMBUSTION AIR RATE, AVERAGE	LB/HR	106359	90200	95129	80705	95553	80589	95376	80589	95904	80347	94819	80778
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	23635	20045	21140	17934	21234	17909	21195	17909	21312	17810	21071	17951
WET FLUE GAS RATE, AVERAGE	LB/HR	116173	97266	105481	87999	106254	87873	106264	87873	107785	87391	104924	88080
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	19285	34096	17625	30953	17888	30908	17863	30909	18338	30739	17437	30981
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.26	$1.06	$1.12	$0.95	$1.13	$0.95	$1.13	$0.95	$1.13	$0.95	$1.12	$0.95
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.90	$0.00	$1.65	$0.00	$1.67	$0.00	$1.67	$0.00	$1.72	$0.00	$1.63	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$3.98	$0.00	$4.66	$0.00	$5.46	$0.00	$4.53	$0.00	$5.10	$0.00	$4.08	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2229	1635	4077	1635	6240	1635	2643	1635	2797	1635	2520	1635
ANNUAL LABOR COST, BURDENED	$/YR	$453,056	$327,148	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048
OPERATORS PER SHIFT	MAN/SHIFT	3.05	2.2	3.08	2.22	3.08	2.22	3.08	2.22	3.08	2.22	3.08	2.22
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$216	$306	$223	$316	$224	$315	$224	$315	$225	$314	$223	$316
RDF FUEL COST, AVERAGE	$/HR	$6.00		$7.00		$9.00		$7.00		$8.00		$212.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$15.22	$6.23	$22.41	$6.44	$32.02	$6.43	$16.28	$6.43	$17.15	$6.39	$15.59	$6.44
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$37,987		$40,436		$40,933		$40,167		$40,307		$40,030	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.090E+11	5.570E+11	4.290E+11	5.830E+11	4.280E+11	5.830E+11	4.280E+11	5.830E+11	4.260E+11	5.790E+11	4.290E+11	5.840E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$44,868	$9,116	$46,739	$8,157	$51,968	$8,145	$46,075	$8,145	$49,979	$8,100	$42,934	$8,165
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,361,539	$2,619,441	$1,405,131	$2,704,243	$1,411,401	$2,700,361	$1,408,792	$2,700,376	$1,416,586	$2,685,351	$1,400,561	$2,706,711
ANNUAL RDF FUEL COST	$/YR	$38,790		$46,704		$56,295		$45,154		$51,890		$1,333,925	
ANNUAL ASH DISPOSAL COST	$/YR	$55,744	$53,371	$140,936	$55,099	$201,418	$55,020	$102,370	$55,020	$107,858	$54,718	$98,056	$55,149
ANNUAL NSW DISPOSAL COST	$/YR	$672,000		$672,000		$672,000		$672,000		$672,000		$672,000	
FURNACE COLD WARMING CO & SMOKE) IF = 1	NONE	0		0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	30.22		30.58		30.4		30.45		30.13		30.71	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$128,506		$142,842		$153,103		$140,486		$147,323		$134,675	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	6 RDF Cofiring	6 Conventional Fuel	7 Percent Ash RDF Cofiring	7 Percent Ash Conventional Fuel	8 RDF Cofiring	8 Conventional Fuel	9 RDF HHV RDF Cofiring	9 RDF HHV Conventional Fuel	10 RDF Cofiring	10 Conventional Fuel	11 RDF Cost RDF Cofiring	11 RDF Cost Conventional Fuel
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$108,736		$114,173		$113,740		$113,741		$112,795		$114,483	
BARE INCREMENTAL COST OF RDH HANDLING SYSTEM	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$384,362		$408,920		$407,280		$407,283		$403,703		$410,093	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	625604		665934		674123		661510		663821		659252	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$825,797		$879,033		$889,842		$873,193		$876,244		$870,212	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$2,031,983	$3,009,076	$2,137,017	$3,097,547	$2,219,087	$3,093,573	$2,099,629	$3,093,589	$2,123,692	$3,078,417	$3,372,578	$3,100,073
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$3,009,076	$0	$3,097,547	$0	$3,093,573	$0	$3,093,589	$0	$3,078,417	$0	$3,100,073
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$5.41	$0.00	$5.31	$0.00	$5.31	$0.00	$5.31	$0.00	$5.31	$0.00	$5.31
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	2.07		1.51		0.56		1.89		1.5		-12	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.97	$5.41	$4.99	$5.31	$5.18	$5.31	$4.91	$5.31	$4.99	$5.31	$7.86	$5.31
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0		$0		$0		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	19395		23352		28148		22577		23945		19951	
Avoided RDH disposal cost	$/YR	$210,000		$210,000		$210,000		$210,000		$210,000		$210,000	
SIR w/disposal credit	NONE	4.49		3.78		2.83		4.19		3.79		-9.7	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	12		13 Cofire Ratio		14		15 Conventional Fuel Cost		16		17 MSW Disposal Credit	
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.82E+07	6.82E+07	6.86E+07	6.86E+07	6.75E+07	6.75E+07	6.82E+07	6.82E+07	6.82E+07	6.82E+07	6.82E+07	6.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.42E+08	1.38E+08	1.49E+08	1.38E+08	1.36E+08	1.38E+08	1.42E+08	1.38E+08	1.42E+08	1.38E+08	1.42E+08	1.38E+08
MAXIMUM TURNDOWN STEAM RATING, STEAM BTUH	BTUH	3.20E+07		3.33E+07		3.07E+07		3.20E+07		3.20E+07		3.20E+07	
BOILER EFFICIENCY AT MCR	NONE	0.77	0.8	0.79	0.8	0.74	0.8	0.77	0.8	0.77	0.8	0.77	0.8
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.68	0.8	0.74	0.8	0.63	0.8	0.68	0.8	0.68	0.8	0.68	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0		0.02		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	9.99E+07	8.51E+07	9.26E+07	8.56E+07	1.08E+08	8.43E+07	9.99E+07	8.51E+07	9.99E+07	8.51E+07	9.99E+07	8.51E+07
RDF FLOWRATE, AVERAGE	TPH	3.17		1.47		5.14		3.17		3.17		3.17	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	5709	8107	7085	8156	4110	8027	5709	8107	5709	8107	5709	8107
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1949	805	1346	810	2626	797	1949	805	1949	805	1949	805
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.47	0.3	0.41	0.3	0.5	0.3	0.47	0.3	0.47	0.3	0.47	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.26	0.37	2.89	0.37	1.83	0.37	2.26	0.37	2.26	0.37	2.26	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	3	0	3	0	3	0	3	0	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0	0.01	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMBTU	30.71	3.43	31.7	3.43	29.72	3.43	30.71	3.43	30.71	3.43	30.71	3.43
COMBUSTION AIR RATE, AVERAGE	LB/HR	94819	80778	87870	81270	102396	79989	94819	80778	94819	80778	94819	80778
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	21071	17951	19527	18060	22755	17775	21071	17951	21071	17951	21071	17951
WET FLUE GAS RATE, AVERAGE	LB/HR	104924	88080	96518	88616	114156	87219	104924	88080	104924	88080	104924	88080
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	17437	30981	16464	31170	18371	30678	17437	30981	17437	30981	17437	30981
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.12	$0.95	$1.04	$0.96	$1.21	$0.94	$1.12	$0.95	$1.12	$0.95	$1.12	$0.95
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.63	$0.00	$1.46	$0.00	$1.82	$0.00	$1.63	$0.00	$1.63	$0.00	$1.63	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$4.08	$0.00	$2.12	$0.00	$6.14	$0.00	$4.08	$0.00	$4.08	$0.00	$4.08	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2520	1635	2067	1635	2960	1635	2520	1635	2520	1635	2520	1635
ANNUAL LABOR COST, BURDENED	$/YR	$457,072	$330,048	$392,426	$330,048	$499,718	$330,048	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048
OPERATORS PER SHIFT	MAN/SHIFT	3.08	2.22	2.64	2.22	3.36	2.22	3.08	2.22	3.08	2.22	3.08	2.22
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$223	$316	$275	$318	$160	$313	$445	$632	$334	$474	$223	$316
RDF FUEL COST, AVERAGE	$/HR	$106.00		$3.00		$10.00		$6.00		$6.00		$6.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$15.59	$6.44	$10.77	$6.48	$21.01	$6.38	$15.59	$6.44	$15.59	$6.44	$15.59	$6.44
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561	6290	8561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$40,030		$37,008		$42,083		$40,030		$40,030		$40,030	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.290E+11	5.840E+11	4.320E+11	5.870E+11	4.250E+11	5.780E+11	4.290E+11	5.840E+11	4.290E+11	5.840E+11	4.290E+11	5.840E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$42,934	$8,164	$29,022	$8,214	$57,691	$8,084	$42,934	$8,165	$42,934	$8,164	$42,934	$8,164
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,400,561	$2,706,711	$1,730,556	$2,723,182	$1,008,319	$2,680,262	$2,801,122	$5,413,422	$2,100,842	$4,060,067	$1,400,561	$2,706,711
ANNUAL RDF FUEL COST	$/YR	$666,962		$18,489		$64,636		$39,902		$39,902		$39,902	
ANNUAL ASH DISPOSAL COST	$/YR	$98,056	$55,149	$67,751	$55,485	$132,163	$54,610	$98,056	$55,149	$98,056	$55,149	$98,056	$55,149
ANNUAL MSW DISPOSAL COST	$/YR	$672,000		$672,000		$672,000		$672,000		$672,000		$1,008,000	
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	30.71		31.7		29.72		30.71		30.71		30.71	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$134,675		$101,407		$160,109		$134,675		$134,675		$134,675	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	12 RDF Cofiring	12 Conventional Fuel	13 Cofire Ratio RDF Cofiring	13 Conventional Fuel	14 RDF Cofiring	14 Conventional Fuel	15 Conventional Fuel Cost RDF Cofiring	15 Conventional Fuel Cost Conventional Fuel	16 RDF Cofiring	16 Conventional Fuel	17 MSW Disposal Credit RDF Cofiring	17 MSW Disposal Credit Conventional Fuel
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$114,483		$90,283		$130,550		$114,483		$114,483		$114,483	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$410,093		$417,756		$402,414		$410,093		$410,093		$410,093	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	659252		609486		693072		659252		659252		659252	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$870,212		$804,522		$914,856		$870,212		$870,212		$870,212	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$2,705,616	$3,100,073	$2,275,251	$3,116,929	$1,804,610	$3,073,005	$3,479,117	$5,806,784	$2,778,836	$4,453,428	$2,078,555	$3,100,072
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$3,100,073	$0	$3,116,929	$0	$3,073,005	$0	$5,806,784	$0	$4,453,428	$0	$3,100,072
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$5.31	$0.00	$5.31	$0.00	$5.31	$0.00	$9.94	$0.00	$7.63	$0.00	$5.31
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-4.69		0.17		4.72		8.63		5.41		2.18	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$6.31	$5.31	$5.27	$5.31	$4.25	$5.31	$8.11	$9.94	$6.48	$7.63	$4.85	$5.31
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0		$0		$0		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	19951		9244		32318		19951		19951		19951	
Avoided MSW disposal cost	$/YR	$210,000		$210,000		$210,000		$210,000		$210,000		$378,000	
SIR w/disposal credit	NONE	-2.39		2.66		6.91		10.93		7.71		6.33	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	18		19		20	
		Ash Disposal Cost					
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventiona Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.82E+07	6.82E+07	6.82E+07	6.82E+07	6.82E+07	6.82E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.42E+08	1.38E+08	1.42E+08	1.38E+08	1.42E+08	1.38E+08
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.20E+07		3.20E+07		3.20E+07	
BOILER EFFICIENCY AT MCR	NONE	0.77	0.8	0.77	0.8	0.77	0.8
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.68	0.8	0.67	0.8	0.66	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	9.99E+07	8.51E+07	1.02E+08	8.51E+07	1.03E+08	8.51E+07
RDF FLOWRATE, AVERAGE	TPH	3.17		3.23		3.28	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	5709	8107	5817	8107	5908	8107
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	1949	805	2074	805	2181	805
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.47	0.3	0.49	0.3	0.51	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.26	0.37	2.26	0.37	2.26	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	3	0	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	30.71	3.43	30.71	3.43	30.71	3.43
COMBUSTION AIR RATE, AVERAGE	LB/HR	94819	80778	96603	80778	98112	80778
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	21071	17951	21467	17951	21803	17951
WET FLUE GAS RATE, AVERAGE	LB/HR	104924	88080	106809	88080	108403	88080
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	17437	30981	17437	30981	17437	30981
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED I= YES	NONE	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.12	$0.95	$1.14	$0.95	$1.16	$0.95
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.63	$0.00	$1.66	$0.00	$1.68	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$4.08	$0.00	$4.14	$0.00	$4.20	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2520	1635	2520	1635	2520	1635
ANNUAL LABOR COST, BURDENED	$/YR	$457,072	$330,048	$457,072	$330,048	$457,072	$330,048
OPERATORS PER SHIFT	MAN/SHIFT	3.08	2.22	3.08	2.22	3.08	2.22
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$223	$316	$227	$316	$230	$316
RDF FUEL COST, AVERAGE	$/HR	$6.00		$6.00		$7.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$15.59	$6.44	$24.89	$9.66	$34.89	$12.88
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8561	6290	8561	6290	8561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$40,030		$40,089		$40,139	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.29E+11	5.84E+11	4.29E+11	5.84E+11	4.29E+11	5.84E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$42,374	$8,164	$43,661	$8,164	$44,274	$8,164
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,400,361	$2,706,711	$1,426,909	$2,706,711	$1,449,192	$2,706,711
ANNUAL RDF FUEL COST	$/YR	$39,902		$40,653		$41,288	
ANNUAL ASH DISPOSAL COST	$/YR	$98,056	$55,149	$156,573	$82,723	$219,464	$110,298
ANNUAL MSW DISPOSAL COST	$/YR	$1,344,000		$672,000		$672,000	
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	30.71		30.71		30.71	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$134,675		$135,658		$136,480	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0	

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Summary of Sensitivity Analysis
PUGET SOUND

definition	UNITS	18 RDF Cofiring	18 Conventional Fuel	19 RDF Cofiring	19 Conventional Fuel	20 RDF Cofiring	20 Conventional Fuel
		Ash Disposal Cost					
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$114,483		$114,483		$114,483	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$410,093		$410,093		$410,093	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	659252		660234		661056	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$870,212		$871,309		$872,594	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$2,078,555	$3,100,072	$2,164,956	$3,127,647	$2,251,429	$3,155,221
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$3,100,072	$0	$3,127,647	$0	$3,155,221
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$5.31	$0.00	$5.36	$0.00	$5.40
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	2.18		1.45		0.73	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$4.85	$5.31	$5.05	$5.36	$5.25	$5.40
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	19951		20326		20644	
Avoided ASH disposal cost	$/YR	$346,000		$210,000		$210,000	
SIR w/disposal credit	NONE	8.17		3.75		3.03	

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Summary of Sensitivity Analysis — Best Case Analysis: 21 to 25; 10% moisture & ash, 60% ratio; $2/T RDF unless otherwise noted

PUGET SOUND

definition	UNITS	21 RDF Cofiring high CF, high MSW	21 Conventional Fuel high CF, high MSW	22 RDF Cofiring actual CF, high MSW	22 Conventional Fuel actual CF, high MSW	23 RDF Cofiring actual CF, actual MSW	23 Conventional Fuel actual CF, actual MSW	24 RDF Cofiring high cf&msw, peak steam	24 Conventional Fuel high cf&msw, peak steam
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	6.81E+07	6.81E+07	6.81E+07	6.81E+07	6.81E+07	6.81E+07	1.05E+08	1.05E+08
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	1.40E+08	1.38E+08	1.40E+08	1.38E+08	1.40E+08	1.38E+08	1.40E+08	1.38E+08
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	3.12E+07		3.12E+07		3.12E+07		3.12E+07	
BOILER EFFICIENCY AT MCR	NONE	0.76	0.8	0.76	0.8	0.76	0.8	0.76	0.8
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.64	0.8	0.64	0.8	0.64	0.8	0.69	0.8
MAXIMUM STEAM DEMAND (MSD)	BTUH	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08
DERATE	NONE	0		0		0		0	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	1.07E+08	8.50E+07	1.07E+08	8.50E+07	1.07E+08	8.50E+07	1.53E+08	1.31E+08
RDF FLOWRATE, AVERAGE	TPH	4.45		4.45		4.45		6.36	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	4071	8091	4071	8091	4071	8091	5819	12490
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	2488	804	2488	804	2488	804	3016	1241
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.53	0.3	0.53	0.3	0.53	0.3	0.44	0.3
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	2.01	0.37	2.01	0.37	2.01	0.37	2.01	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	3	0	3	0	3	0	3	0
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0	0.02	0	0.02	0	0.02	0
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	30.24	3.43	30.24	3.43	30.24	3.43	30.24	3.43
COMBUSTION AIR RATE, AVERAGE	LB/HR	101417	80623	101417	80623	101417	80623	144951	124453
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	22537	17916	22537	17916	22537	17916	32211	27656
WET FLUE GAS RATE, AVERAGE	LB/HR	111906	87910	111906	87910	111906	87910	160483	135702
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	17656	30922	17656	30922	17656	30922	42072	47732
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONRTOL DEVICE REQUIRED != YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$1.20	$0.95	$1.20	$0.95	$1.20	$0.95	$1.71	$1.47
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$1.75	$0.00	$1.75	$0.00	$1.75	$0.00	$3.87	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$3.44	$0.00	$3.44	$0.00	$3.44	$0.00	$7.37	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	2786	1635	2786	1635	2786	1635	2786	1635
ANNUAL LABOR COST, BURDENED	$/YR	$499,718	$330,048	$499,718	$330,048	$499,718	$330,048	$499,718	$330,048
OPERATORS PER SHIFT	MAN/SHIFT	3.36	2.22	3.36	2.22	3.36	2.22	3.36	2.22
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$318	$631	$159	$316	$159	$316	$454	$974
RDF FUEL COST, AVERAGE	$/HR	$9.00		$9.00		$9.00		$13.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$19.91	$6.43	$19.91	$6.43	$19.91	$6.43	$24.13	$9.92
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	$6,290	$8,561	$6,290	$8,561	$6,290	$8,561	$6,290	$8,561
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$42,059		$42,059		$42,059		$41,784	
AVAILABILITY, FRACTION	NONE	0.72	0.98	0.72	0.98	0.72	0.98	0.72	0.98
ANNUAL STEAM PRODUCTION, NET	BTU	4.28E+11	5.83E+11	4.28E+11	5.83E+11	4.28E+11	5.83E+11	6.610E+11	9.000E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$52,745	$8,149	$52,745	$8,148	$52,745	$8,148	$81,465	$12,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$1,997,360	$3,403,029	$998,680	$2,701,515	$998,680	$2,701,515	$2,854,741	$8,340.351
ANNUAL RDF FUEL COST	$/YR	$56,016		$56,016		$56,016		$80,061	
ANNUAL ASH DISPOSAL COST	$/YR	$125,205	$55,043	$125,205	$55,043	$125,205	$55,043	$151,756	$84,967
ANNUAL NEW DISPOSAL COST	$/YR	$1,344,000		$1,344,000		$672,000		$1,344,000	

Summary of Sensitivity Analysis — Best Case Analysis: 21 to 25; 10% moisture & ash, 60% ratio; $2/T RDF unless otherwise noted

PUGET SOUND

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Summary of Sensitivity Analysis — Best Case Analysis: 21 to 25; 10% moisture & ash, 60% ratio; 62/7 RDF unless otherwise noted

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		21		22		23		24	
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
definition	UNITS	high CF, high MSW		actual CF, high MSW		actual CF, actual MSW		high cfbmss, peak steam	
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	90		90		90		90	
NEW HAI EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	30.24		30.24		30.24		430	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$152,907		$152,907		$152,907		$148,384	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	90		90		90		90	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	90		90		90		90	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$132,146		$132,146		$132,146		$132,146	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	90		90		90		90	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	90		90		90		90	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$407,616		$407,616		$407,616		$407,616	
BARE TOTAL INCREMENTAL CAPITAL COSTS	$	692668		692668		692668		688145	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$914,322		$914,322		$914,322		$908,352	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	90		90		90		90	
TOTAL ANNUAL O&M COST	$/YR	$2,773,103	$5,796,269	$1,774,423	$3,094,754	$1,774,423	$3,094,754	$3,709,525	$8,767,944
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	90	$5,796,269	90	$3,094,754	90	$3,094,754	90	$8,767,944
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$9.95	$0.00	$5.31	$0.00	$5.31	$0.00	$9.75
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	15.5		5.21		5.21		28.7	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$6.48	$9.95	$4.14	$5.31	$4.14	$5.31	$5.61	$9.75
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RDF	$/YR	90		90		90		90	
TONS PER YEAR RDF REQUIRED	TPY	28008.00		28008.00		28008.00		40030	
Avoided MSW disposal cost	$/YR	$546,000		$546,000		$210,000		$546,000	
SIR w/disposal credit	NONE	21.2		10.91		7.4		34.43	

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNITS	A Baseline RDF Cofiring	A Baseline Conventional Fuel	B Steam demand RDF Cofiring	B Steam demand Conventional Fuel	C RDF Moisture RDF Cofiring	C RDF Moisture Conventional Fuel	D RDF Moisture RDF Cofiring	D RDF Moisture Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.81E+07	1.81E+07	2.21E+07	2.21E+07	2.38E+07	2.38E+07	1.80E+07	1.80E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	5.98E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07	6.11E+07	6.13E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.36E+07		1.36E+07		1.36E+07		1.37E+07	1.34E+07
BOILER EFFICIENCY AT MCR	NONE	0.78	0.85	0.78	0.85	0.78	0.85	0.79	0.85
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.67	0.85	0.7	0.85	0.71	0.85	0.68	0.85
MAXIMUM STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.37E+07	3.37E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0.02		0.02		0.02		0	0.05
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.69E+07	2.13E+07	3.17E+07	2.68E+07	3.37E+07	2.80E+07	2.65E+07	2.12E+07	2.71E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.85		1.01		1.07		0.74	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	1312	1732	1546	2110	1645	2274	1291	1721	1323	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	558	135	608	165	627	178	533	135	590	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.52	0.04	0.48	0.04	0.46	0.04	0.54	0.04	0.49	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.09	0.37	0.09	0.37	0.09	0.37	0.1	0.37	0.09	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	1	3	1	3	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.25	2.34	1.25	2.34	1.25	2.34	1.27	2.34	1.23	2.34
COMBUSTION AIR RATE, AVERAGE	LB/HR	25916	20528	30536	25007	32500	26946	25508	20393	26137	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5759	4562	6786	5557	7222	5988	5669	4532	5808	4532
WET FLUE GAS RATE, AVERAGE	LB/HR	28377	22124	33486	26951	35660	29042	27738	21979	28888	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2658	7203	3945	8775	4581	9435	2533	7156	2750	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.38	$0.30	$0.45	$0.37	$0.47	$0.39	$0.37	$0.30	$0.38	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.34	$0.00	$0.49	$0.00	$0.57	$0.00	$0.33	$0.00	$0.36	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$1.65	$0.00	$1.90	$0.00	$2.01	$0.00	$1.46	$0.00	$1.90	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1013	458	1013	458	1013	458	963	458	1079	458
ANNUAL LABOR COST, BURDENED	$/YR	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/SHIFT	1.92	1.38	1.92	1.38	1.92	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$37.00	$49.00	$43.00	$59.00	$46.00	$64.00	$36.00	$48.00	$37.00	$48.00
RDF FUEL COST, AVERAGE	$/HR	$2.00		$2.00		$2.00		$1.00		$2.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$1.12	$0.27	$1.22	$0.33	$1.25	$0.36	$1.07	$0.27	$1.18	$0.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8649	6290	8649	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,469		$22,940		$22,388		$22,221		$22,781	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.4E+11	1.9E+11	1.5E+11	2.1E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$14,949	$2,595	$17,877	$3,161	$19,157	$3,406	$13,572	$2,578	$16,588	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$231,886	$420,916	$273,216	$512,750	$290,789	$552,526	$228,237	$418,152	$233,863	$418,152
ANNUAL RDF FUEL COST	$/YR	$10,741		$12,655		$13,469		$9,254		$12,638	
ANNUAL ASH DISPOSAL COST	$/YR	$7,025	$2,343	$7,645	$2,855	$7,882	$3,076	$6,699	$2,328	$7,419	$2,328
ANNUAL NSW DISPOSAL COST	$/YR	$0	$82,500	$0	$82,500	$0	$82,500	$0	$82,500	$0	$82,500
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEV'CE INCLUDED IN CAPITAL COST	LB/MMBTU	1.25		1.25		1.25		1.27		1.23	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$75,377		$76,185		$74,045		$71,294		$80,520	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$65,906		$67,394		$65,906		$65,906		$65,906	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,760		$234,223		$228,760		$228,760		$228,760	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$370,043		$377,802		$368,711		$365,959		$375,185	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$488,456		$498,698		$486,698		$483,066		$495,245	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$571,917	$631,541	$619,181	$724,452	$638,543	$764,695	$564,827	$628,745	$578,137	$628,745
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$631,541	$0	$724,452	$0	$764,695	$0	$628,745	$0	$628,745
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$4.03	$0.00	$3.79	$0.00	$3.71	$0.00	$4.04	$0.00	$4.04
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.20		-1.77		-1.62		-2.12		-2.33	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$5.01	$4.03	$4.46	$3.79	$4.27	$3.71	$4.99	$4.04	$5.10	$4.04
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	5370		6328		6735		4625		6319	

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNITS	5 Excess Air RDF Cofiring	5 Excess Air Conventional Fuel	6 RDF Cofiring	6 Conventional Fuel	7 Percent Ash RDF Cofiring	7 Percent Ash Conventional Fuel	8 RDF Cofiring	8 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	6.44E+07	6.16E+07	5.58E+07	6.09E+07	5.94E+07	6.13E+07	5.88E+07	6.13E+07
MAXIMUN TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.37E+07		1.35E+07		1.35E+07		1.35E+07	
BOILER EFFICIENCY AT MCR	NONE	0.79	0.86	0.78	0.85	0.78	0.85	0.77	0.85
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.68	0.86	0.67	0.85	0.67	0.85	0.67	0.85
MAXIMUN STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0		0.08		0.03		0.04	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.66E+07	2.10E+07	2.69E+07	2.13E+07	2.69E+07	2.12E+07	2.70E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.84		0.85		0.99		1.2	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	1298	1711	1311	1730	1310	1721	1318	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	556	134	556	135	785	135	1109	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.52	0.04	0.52	0.04	0.37	0.04	0.26	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.1	0.34	0.09	0.41	0.06	0.37	0.04	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	2	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.03	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.26	2.11	1.24	2.57	1.25	2.34	1.24	2.34
COMBUSTION AIR RATE, AVERAGE	LB/HR	23699	18741	27853	22064	25880	20393	26028	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5266	4163	6190	4903	5751	4532	5784	4532
WET FLUE GAS RATE, AVERAGE	LB/HR	26130	20318	30314	23659	28394	21979	28638	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2393	6629	2886	7688	2656	7156	2703	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONNTOL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.35	$0.27	$0.41	$0.32	$0.38	$0.30	$0.38	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.30	$0.00	$0.38	$0.00	$0.34	$0.00	$0.35	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$1.64	$0.00	$1.65	$0.00	$1.88	$0.00	$2.21	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1084	458	951	458	1635	458	2547	458
ANNUAL LABOR COST, BURDENED	$/YR	$285,791	$206,367	$283,903	$205,004	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/SHIFT	1.92	1.39	1.91	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$36.00	$48.00	$37.00	$49.00	$37.00	$48.00	$37.00	$48.00
RDF FUEL COST, AVERAGE	$/HR	$2.00		$2.00		$2.00		$2.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$1.11	$0.27	$1.11	$0.27	$1.57	$0.27	$2.22	$0.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8649	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,462		$22,479		$22,762		$23,133	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$14,378	$2,359	$15,364	$2,789	$16,389	$2,578	$18,494	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$229,424	$415,776	$231,665	$420,535	$231,561	$418,152	$232,888	$418,152
ANNUAL RDF FUEL COST	$/YR	$10,627		$10,731		$12,313		$13,102	
ANNUAL ASH DISPOSAL COST	$/YR	$6,999	$2,315	$6,993	$2,341	$9,880	$2,328	$13,946	$2,328
ANNUAL NSW DISPOSAL COST	$/YR	$0	$82,500	$0	$82,500	$0	$82,500	$0	$82,500
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	1.26		1.24		1.25		1.24	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$75,257		$75,543		$80,210		$86,313	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$65,906		$65,906		$65,906		$65,906	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,760		$228,760		$228,760		$228,760	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$	369923		$370,208		$374,875		$380,978	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$488,298		$488,675		$494,835		$502,892	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$569,681	$626,827	$571,133	$630,690	$577,953	$628,745	$588,412	$628,745
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	0	626827	$0	$630,690	$0	$628,745	$0	$628,745
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$4.02	$0.00	$4.05	$0.00	$4.04	$0.00	$4.04
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.22		-2.2		-2.33		-2.49	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	5.03	4.02	$5.04	$4.05	$5.10	$4.04	$5.19	$4.04
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	0		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	5313		5365		6257		7551	

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

		9		10		11		12	
		RDF HHV				RDF Cost			
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
definition	UNITS								
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	5.75E+07	6.13E+07	5.88E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.33E+07		1.35E+07		1.36E+07		1.36E+07	
BOILER EFFICIENCY AT MCR	NONE	0.77	0.85	0.78	0.85	0.78	0.85	0.78	0.85
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.66	0.85	0.67	0.85	0.67	0.85	0.67	0.85
MAXIMUM STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0.06		0.04		0.02		0.02	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.72E+07	2.12E+07	2.70E+07	2.12E+07	2.67E+07	2.12E+07	2.67E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	1.11		0.96		0.85		0.85	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	1328	1721	1315	1721	1305	1721	1305	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	611	135	580	135	557	135	557	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.47	0.04	0.5	0.04	0.52	0.04	0.52	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.08	0.37	0.09	0.37	0.09	0.37	0.09	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	1	3	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.23	2.34	1.24	2.34	1.25	2.34	1.25	2.34
COMBUSTION AIR RATE, AVERAGE	LB/HR	26230	20393	25972	20393	25775	20393	25775	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5829	4532	5772	4532	5728	4532	5728	4532
WET FLUE GAS RATE, AVERAGE	LB/HR	29168	21979	28632	21979	28221	21979	28221	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2797	7156	2698	7156	2623	7156	2623	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.38	$0.30	$0.38	$0.30	$0.38	$0.30	$0.38	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.36	$0.00	$0.35	$0.00	$0.34	$0.00	$0.34	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$2.07	$0.00	$1.83	$0.00	$1.65	$0.00	$1.65	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1128	458	1064	458	1013	458	1013	458
ANNUAL LABOR COST, BURDENED	$/YR	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/SHIFT	1.92	1.38	1.92	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$37.00	$48.00	$37.00	$48.00	$37.00	$48.00	$37.00	$48.00
RDF FUEL COST, AVERAGE	$/HR	$2.00		$2.00		$35.00		$17.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$1.22	$0.27	$1.16	$0.27	$1.11	$0.27	$1.11	$0.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8649	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,977		$22,701		$22,471		$22,471	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$17,706	$2,578	$16,107	$2,578	$14,862	$2,578	$14,862	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$234,691	$418,152	$232,387	$418,152	$230,620	$418,152	$230,620	$418,152
ANNUAL RDF FUEL COST	$/YR	$13,977		$12,110		$220,055		$110,027	
ANNUAL ASH DISPOSAL COST	$/YR	$7,690	$2,328	$7,302	$2,328	$7,004	$2,328	$7,004	$2,328
ANNUAL MSW DISPOSAL COST	$/YR	$0	$82,500	$0	$82,500	$0	$82,500	$0	$82,500
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		0		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE	LB/MMBTU	1.23		1.24		1.25		1.25	
INCLUDED IN CAPITAL COST									
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$83,745		$79,190		$75,410		$75,410	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$65,906		$65,906		$65,906		$65,906	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,760		$228,760		$228,760		$228,760	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$378,410		$373,855		$370,075		$370,075	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$499,502		$493,489		$488,499		$488,499	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$581,889	$628,745	$575,453	$628,745	$779,859	$628,745	$669,832	$628,745
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$628,745	$0	$628,745	$0	$628,745	$0	$628,745
TOTAL COAT PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$4.04	$0.00	$4.04	$0.00	$4.04	$0.00	$4.04
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.38		-2.28		-6.3		-4.15	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$5.14	$4.04	$5.08	$4.04	$6.88	$4.04	$5.91	$4.04
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	6988		6055		5341		5341	

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNITS	13 Cofire Ratio RDF Cofiring	13 Cofire Ratio Conventional Fuel	14 RDF Cofiring	14 Conventional Fuel	15 Conventional Fuel Cost RDF Cofiring	15 Conventional Fuel Cost Conventional Fuel	16 RDF Cofiring	16 Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.82E+07	1.82E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	6.28E+07	6.13E+07	5.69E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07
MAXIMUM TURBOGEN STEAM RATING, SEAM BTUH	BTUH	1.41E+07		1.31E+07		1.36E+07		1.36E+07	
BOILER EFFICIENCY AT MCR	NONE	0.81	0.85	0.76	0.85	0.78	0.85	0.78	0.85
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.74	0.85	0.61	0.85	0.67	0.85	0.67	0.85
MAXIMUM STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DEBATE	NONE	0		0.07		0.02		0.02	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.44E+07	2.13E+07	2.97E+07	2.12E+07	2.67E+07	2.12E+07	2.67E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.39		1.41		0.85		0.85	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	1589	1735	965	1721	1305	1721	1305	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	364	136	785	135	557	135	557	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.46	0.04	0.55	0.04	0.52	0.04	0.52	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.12	0.37	0.08	0.37	0.09	0.37	0.09	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	2	3	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.29	2.34	1.21	2.34	1.25	2.34	1.25	2.34
COMBUSTION AIR RATE, AVERAGE	LB/HR	23545	20561	28585	20393	25775	20393	25775	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5232	4569	6352	4532	5728	4532	5728	4532
WET FLUE GAS RATE, AVERAGE	LB/HR	25546	22160	31590	21979	28221	21979	28221	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2487	6957	2819	7156	2623	7156	2623	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.34	$0.30	$0.42	$0.30	$0.38	$0.30	$0.38	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.30	$0.00	$0.39	$0.00	$0.34	$0.00	$0.34	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$0.85	$0.00	$2.54	$0.00	$1.65	$0.00	$1.65	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	819	458	1201	458	1013	458	1013	458
ANNUAL LABOR COST, BURDENED	$/YR	$244,560	$205,686	$311,425	$205,686	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/SHIFT	1.65	1.38	2.1	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$45.00	$49.00	$27.00	$48.00	$55.00	$73.00	$73.00	$97.00
RDF FUEL COST, AVERAGE	$/HR	$1.00		$3.00		$2.00		$2.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$0.73	$0.27	$1.57	$0.27	$1.11	$0.27	$1.11	$0.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6065	8340	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$20,353		$24,120		$22,471		$22,471	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.5E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.560E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$9,033	$2,506	$21,069	$2,578	$14,862	$2,578	$14,862	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$270,861	$406,545	$170,512	$418,152	$345,930	$627,228	$461,240	$836,304
ANNUAL RDF FUEL COST	$/YR	$4,705		$17,771		$10,682		$10,682	
ANNUAL ASH DISPOSAL COST	$/YR	$4,418	$2,263	$9,879	$2,328	$7,004	$2,328	$7,004	$2,328
ANNUAL NSW DISPOSAL COST	$/YR	$0	$82,500	$0	$82,500	$0	$82,500	$0	$82,500
FURNACE COLD (MAKING CO & SMOKE) IF = 1	NONE	0		1		0		0	
NEW MAX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/MMBTU	1.29		1.21		1.25		1.25	
BARE CAPITAL COST OF STORAGE SUBSYSTEM	$	$55,375		$91,968		$75,410		$75,410	
BARE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$51,067		$76,511		$65,906		$65,906	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,760		$228,760		$228,760		$228,760	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$335,202		$397,238		$370,075		$370,075	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$442,466		$524,355		$488,499		$488,499	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$553,931	$617,001	$554,775	$628,745	$685,797	$837,821	$801,107	$1,046,897
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$617,001	$0	$628,745	$0	$837,821	$0	$1,046,897
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$4.07	$0.00	$4.04	$0.00	$5.38	$0.00	$6.72
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.27		-1.77		-1.49		-0.78	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$5.03	$4.07	$4.90	$4.04	$6.05	$5.38	$7.07	$6.72
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	2352		8885		5341		5341	

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNITS	17		18		19		20	
		MSW Disposal cost				Ash Disposal Cost			
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, ABS MAX FOR COFIRED CASE (RERATED AT HI VELOCITY)	BTUH	5.98E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07
MAXIMUM TURNDOWN STEAM RATING, SEAM BTUH	BTUH	1.36E+07		1.36E+07		1.36E+07		1.36E+07	
BOILER EFFICIENCY AT MCR	NONE	0.78	0.85	0.78	0.85	0.78	0.85	0.78	0.85
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.67	0.85	0.67	0.85	0.67	0.85	0.66	0.85
MAXIMUM STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0.02		0.02		0.02		0.02	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.67E+07	2.12E+07	2.67E+07	2.12E+07	2.70E+07	2.12E+07	2.73E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.85		0.85		0.86		0.87	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/HR	1305	1721	1305	1721	1319	1721	1330	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/HR	557	135	557	135	576	135	592	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.52	0.04	0.52	0.04	0.53	0.04	0.54	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.09	0.37	0.09	0.37	0.09	0.37	0.09	0.37
FLYASH EMISSION ABSOLUTE AVG EXISTING CONTROL DEVICE AT MCR	LB/HR	1	3	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/MMBTU	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMMISSION, MAX HOURLY AT MCR	LB/MMBTU	1.25	2.34	1.25	2.34	1.25	2.34	1.25	2.34
COMBUSTION AIR RATE, AVERAGE	LB/HR	25775	20393	25775	20393	26051	20393	26282	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5728	4532	5728	4532	5789	4532	5840	4532
WET FLUE GAS RATE, AVERAGE	LB/HR	28221	21979	28221	21979	28511	21979	28752	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2623	7156	2623	7156	2623	7156	2623	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.38	$0.30	$0.38	$0.30	$0.38	$0.30	$0.38	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.34	$0.00	$0.34	$0.00	$0.34	$0.00	$0.35	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$1.65	$0.00	$1.65	$0.00	$1.66	$0.00	$1.67	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/HR	1013	458	1013	458	1013	458	1013	458
ANNUAL LABOR COST, BURDENED	$/YR	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/SHIFT	1.92	1.38	1.92	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$37.00	$48.00	$37.00	$48.00	$37.00	$48.00	$37.00	$48.00
RDF FUEL COST, AVERAGE	$/HR	$2.00		$2.00		$2.00		$2.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$1.11	$0.27	$1.11	$0.27	$1.73	$0.40	$2.37	$0.54
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOURS	6290	8649	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,471		$22,471		$22,496		$22,506	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$14,862	$2,578	$14,862	$2,578	$15,004	$2,578	$15,122	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$230,620	$418,152	$230,620	$418,152	$233,094	$418,152	$235,156	$418,152
ANNUAL RDF FUEL COST	$/YR	$10,682		$10,682		$10,797		$10,892	
ANNUAL ASH DISPOSAL COST	$/YR	$7,004	$2,328	$7,004	$2,328	$10,870	$3,490	$14,901	$4,656
ANNUAL MSW DISPOSAL COST	$/YR	$0	$110,250	$0	$165,000	$0	$82,500	$0	$82,500
FURNACE COIL (WORKING TO A SMOKE) UP TO	NONE	0		0		0		0	
NEW NOX EMISSIONS RATE W/ NEW CONTROL DEV INCLUDED IN CAPITAL COST	LB/MMBTU	1.25		1.25		1.25		1.25	
BARE CAPITAL COST OF 5 BOILER SUBSYSTEM	$	$75,410		$75,410		$75,704		$75,945	
BARE CAPITAL COST OF LOW MECHANICAL COMPLEXITY	$	$0		$0		$0		$0	
BARE CAPITAL COST OF SHOP MECHANICAL COMPLEXITY	$	$0		$0		$0		$0	
BARE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$65,306		$65,306		$65,306		$65,306	
BARE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0	
BARE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0	
BARE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$140,760		$228,760		$228,760		$228,760	

BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$370,075		$370,075		$370,390		$370,650	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$488,499		$488,499		$488,915		$489,258	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$570,487	$628,745	$570,487	$628,745	$577,104	$629,909	$583,425	$631,073
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$628,745	$0	$628,745	$0	$629,909	$0	$631,073
TOTAL COST PER MILLION BTU OF STEAM	$/MMBTU	$0.00	$4.04	$0.00	$4.04	$0.00	$4.04	$0.00	$4.05
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.21		-2.21		-2.32		-2.43	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MMBTU	$5.04	$4.04	$5.04	$4.04	$5.09	$4.04	$5.15	$4.05
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0.00		$0.00		$0.00		$0.00	
TONS PER YEAR RDF REQUIRED	TPY	5341		5341		5398		5446	

Navy\7\sub-base

Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNIT	21: SIR w/ credit Actual MSW $ RDF Cofiring	Conventional Fuel	22: SIR w/ credit MSW$ +50% RDF Cofiring	Conventional Fuel	23: SIR w/ credit MSW$ +100% RDF Cofiring	Conventional Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, ASB MAX FOR COFIRED CASE (DERATED AT HI VELOCITY)	BTUH	5.98E+07	6.13E+07	5.98E+07	6.13E+07	5.98E+07	6.13E+07
MAXIMUM TURBOGEN STEAM RATING, SEAM BTUH	BTUH	1.35E+07		1.35E+07		1.35E+07	
BOILER EFFICIENCY AT MCR	NONE	0.78	0.85	0.78	0.85	0.78	0.85
BOILER EFFICIENCY AT AVERAGE OUTPUT	NONE	0.67	0.85	0.67	0.85	0.67	0.85
MAXIMUM STEAM DEMAND (USED)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0.02		0.02		0.02	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.67E+07	2.12E+07	2.67E+07	2.12E+07	2.67E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.85		0.85		0.85	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/H	1305	1721	1305	1721	1305	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/H	557	135	557	135	557	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.52	0.04	0.52	0.04	0.52	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.09	0.37	0.09	0.37	0.09	0.37
FLYASH EMISSION ADDITIVE AVG EXISTING CONTROL DEVICE AT MCR	LB/H	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/H	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/H	1.25	2.34	1.25	2.34	1.25	2.34
COMBUSTION AIR RATE, AVERAGE	LB/H	25775	20393	25775	20393	25775	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5728	4532	5728	4532	5728	4532
WET FLUE GAS RATE, AVERAGE	LB/H	28821	21979	28821	21979	28821	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2623	7156	2623	7156	2623	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0
ELECTRIC POWER COST FOR FB SYSTEM, AVERAGE	$/HR	90.38	90.30	90.38	90.30	90.38	90.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	90.34	90.00	90.34	90.00	90.34	90.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	91.65	90.00	91.65	90.00	91.65	90.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/H	1013	458	1013	458	1013	458
ANNUAL LABOR COST, BURDENED	$/YR	$284,848	$205,686	$284,848	$205,686	$284,848	$205,686
OPERATORS PER SHIFT	MAN/	1.92	1.38	1.92	1.38	1.92	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	637.00	948.00	637.00	948.00	637.00	948.00
RDF FUEL COST, AVERAGE	$/HR	92.00		92.00		92.00	
ASH DISPOSAL COST, AVERAGE	$/HR	91.11	90.27	91.11	90.27	91.11	90.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY RANGE	HOUR	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,471		$22,471		$22,471	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$14,862	$2,578	$14,862	$2,578	$14,862	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$230,620	$418,152	$230,620	$418,152	$230,620	$418,152
ANNUAL RDF FUEL COST	$/YR	$10,682		$10,682		$10,682	
ANNUAL ASH DISPOSAL COST	$/YR	$7,004	$2,328	$7,004	$2,328	$7,004	$2,328
ANNUAL NOX DISPOSAL COST	$/YR	$0	$82,300	$0	$123,750	$0	$165,000
FURNACE COLD CRANKING (0 & SHOKE) IF = 1	NONE	0		0		0	
NEW NOX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/H	1.25		1.25		1.25	
BASE CAPITAL COST OF STORAGE SUBSYSTEM	$	$75,410		$75,410		$75,410	
BASE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0	
BASE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0	
BASE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$63,906		$63,906		$63,906	
BASE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0	
BASE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0	
BASE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,750		$228,750		$228,750	

out 4 summary

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BARE TOTAL INCREMENTAL CAPITAL COSTS	$	$370,075		$370,075		$370,075	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$488,499		$488,499		$488,499	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$570,487	$628,745	$570,487	$628,745	$570,487	$628,745
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$628,745	$0	$628,745	$0	$628,745
TOTAL COST PER MILLION BTU OF STEAM	$/MM	$0.00	$4.04	$0.00	$4.04	$0.00	$4.04
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.21		-2.21		-2.21	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MM	$3.04	$4.04	$3.04	$4.04	$3.04	$4.04
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS ASF	$/YR	$0.00		$0.00		$0	
TONS PER YEAR RDF REQUIRED	TPY	5341		5341		5341	
Avoided MSW disposal cost	$/YR	$24,750		$45,375		$66,000	
SIR w/disposal credit	NONE	-1.73		-1.32		-0.92	

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Summary of Sensitivity Analysis
Sub Base Bangor, Washington

definition	UNIT	Conventional Fuel Down 25% RDF Cofiring	Conventional Fuel	Best Case Analysis 1 RDF Cofiring	Conventional Fuel	2 RDF Cofiring	Conventional Fuel	3 RDF Cofiring	Conventional Fuel	4 RDF Cofiring	Conventional Fuel	5 RDF Cofiring	Conventional Fuel	6 RDF Cofiring	Conventio Fuel
ENTHALPY TRANSFERED TO STEAM, AVG HOURLY, 100% AVAILABILITY	BTUH	1.80E+07	1.80E+07	2.38E+07	2.38E+07	2.38E+07	2.38E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07	1.80E+07
MCR, AVG HOR FOR COFIRED CASE (DERATED AT HI VELOCITY)	BTUH	5.98E+07	6.13E+07	5.88E+07	6.13E+07	5.88E+07	6.13E+07	5.88E+07	6.13E+07	5.88E+07	6.13E+07	5.88E+07	6.13E+07	5.88E+07	6.13E+07
MAXIMUM TURBOGEN STEAM RATING, STEAM BTUH	BTUH	1.35E+07		1.33E+07		1.33E+07		1.33E+07		1.33E+07		1.33E+07		1.33E+07	
BOILER EFFICIENCY AT MCR	NONE	0.78	0.85	0.77	0.85	0.77	0.85	0.77	0.85	0.77	0.85	0.77	0.85	0.77	0.85
BOILER EFFICIENCY AT AVERGE OUTPUT	NONE	0.67	0.85	0.67	0.85	0.67	0.85	0.62	0.85	0.62	0.85	0.62	0.85	0.62	0.85
MAXIMUM STEAM DEMAND (MSD)	BTUH	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07	3.17E+07
DERATE	NONE	0.02		0.04		0.04		0.04		0.04		0.04		0.04	
TOTAL FUEL INPUT ENTHALPY, AVERAGE	BTUH	2.67E+07	2.12E+07	3.58E+07	2.80E+07	3.58E+07	2.80E+07	2.92E+07	2.12E+07	2.92E+07	2.12E+07	2.92E+07	2.12E+07	2.92E+07	2.12E+07
RDF FLOWRATE, AVERAGE	TPH	0.85		1.49		1.49		1.22		1.22		1.22		1.22	
CONVENTIONAL FUEL INPUT ENTHALPY, AVERAGE	LB/H	1305	1721	1164	2274	1164	2274	950	1721	950	1721	950	1721	950	1721
SOLID RESIDUE GENERATED, AVERAGE	LB/H	557	135	793	178	793	178	745	135	745	135	745	135	745	135
CARBON CONTENT OF SOLID RESIDUE, MAX HOURLY AT MCR	NONE	0.52	0.04	0.51	0.04	0.51	0.04	0.58	0.04	0.58	0.04	0.58	0.04	0.58	0.04
FLYASH FRACTION OF SOLID RESIDUE, AVERAGE	NONE	0.69	0.37	0.08	0.37	0.08	0.37	0.08	0.37	0.08	0.37	0.08	0.37	0.08	0.37
FLYASH EMISSION ABSOLUTE AND EXISTING CONTROL DEVICE AT MCR	LB/H	1	3	1	3	1	3	1	3	1	3	1	3	1	3
EMISSION OF TSP, MAX HOURLY W/ EXISTING CNTRL AT MCR	LB/H	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
UNCONTROLLED FLYASH EMISSION, MAX HOURLY AT MCR	LB/H	1.25	2.34	1.23	2.34	1.23	2.34	1.23	2.34	1.23	2.34	1.23	2.34	1.23	2.34
COMBUSTION AIR RATE, AVERAGE	LB/H	25775	20393	34488	26946	34488	26946	28152	20393	28152	20393	28152	20393	28152	20393
COMBUSTION AIR VOLUMETRIC FLOWRATE, AVERAGE	ACFM	5728	4532	7664	5988	7664	5988	6256	4532	6256	4532	6256	4532	6256	4532
WET FLUE GAS RATE, AVERAGE	LB/H	26221	21979	37842	29042	37842	29042	30791	21979	30791	21979	30791	21979	30791	21979
WET FLUE GAS VOLUMETRIC FLOW, AVERAGE	ACFM	2623	7156	4664	9455	4664	9455	2671	7156	2671	7156	2671	7156	2671	7156
EMISSION CNTRL DEVICE ASSUMED EFFICIENCY (EXISTING DEVICE)	NONE	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEW EMISSION CONTROL DEVICE REQUIRED 1= YES	NONE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRIC POWER COST FOR FD SYSTEM, AVERAGE	$/HR	$0.38	$0.30	$0.50	$0.39	$0.50	$0.39	$0.41	$0.30	$0.41	$0.30	$0.41	$0.30	$0.41	$0.30
ELECTRIC POWER COST FOR ID SYSTEM, AVERAGE	$/HR	$0.34	$0.00	$0.61	$0.00	$0.61	$0.00	$0.37	$0.00	$0.37	$0.00	$0.37	$0.00	$0.37	$0.00
MISC ELECTRIC POWER COSTS, AVERAGE	$/HR	$1.65	$0.00	$2.66	$0.00	$2.66	$0.00	$2.24	$0.00	$2.24	$0.00	$2.24	$0.00	$2.24	$0.00
SOLID RESIDUE GENERATED, MAX HOURLY AT MCR	LB/H	1013	458	1129	458	1129	458	1129	458	1129	458	1129	458	1129	458
ANNUAL LABOR COST, BURDENED	$/YR	$284,848	$205,686	$311,425	$205,686	$311,425	$205,686	$311,425	$205,686	$311,425	$205,686	$311,425	$205,686	$311,425	$205,686
OPERATORS PER SHIFT	MEN/	1.92	1.38	2.1	1.38	2.1	1.38	2.1	1.38	2.1	1.38	2.1	1.38	2.1	1.38
CONVENTIONAL FUEL COST, AVERAGE	$/HR	$37.00	$48.00	$65.00	$128.00	$65.00	$128.00	$53.00	$97.00	$53.00	$97.00	$27.00	$48.00	$27.00	$48.00
RDF FUEL COST, AVERAGE	$/HR	$2.00		$3.00		$3.00		$2.00		$2.00		$25.00		$25.00	
ASH DISPOSAL COST, AVERAGE	$/HR	$1.11	$0.27	$1.59	$0.36	$1.59	$0.36	$1.49	$0.27	$1.49	$0.27	$1.49	$0.27	$1.49	$0.27
OPERATING HRS/YR IN COFIRED STEAM SUPPLY MODE	HOUR	6290	8649	6290	8649	6290	8649	6290	8649	6290	8649	6290	8649	6290	8649
INCREMENTAL MAINTENANCE COST, ANNUAL	$/YR	$22,471		$23,652		$23,652		$23,805		$23,805		$23,805		$23,805	
AVAILABILITY, FRACTION	NONE	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99	0.72	0.99
ANNUAL STEAM PRODUCTION, NET	BTU	1.1E+11	1.6E+11	1.5E+11	2.060E+11	1.5E+11	2.060E+11	1.1E+11	1.560E+11	1.1E+11	1.560E+11	1.1E+11	1.6E+11	1.1E+11	1.6E+11
RELATIVE ELECTRIC POWER ANNUAL COST	$/YR	$14,862	$2,578	$23,704	$3,406	$23,704	$3,406	$19,005	$2,578	$19,005	$2,578	$19,005	$2,578	$19,005	$2,578
ANNUAL CONVENTIONAL FUEL COST	$/YR	$230,620	$418,152	$411,443	$1,105,052	$411,443	$1,105,052	$335,847	$836,304	$335,847	$836,304	$167,923	$418,152	$167,923	$418,152
ANNUAL RDF FUEL COST	$/YR	$10,682		$18,760		$18,760		$15,313		$15,313		$157,727		$157,727	
ANNUAL ASH DISPOSAL COST	$/YR	$7,004	$2,328	$9,373	$3,076	$9,373	$3,076	$9,375	$2,328	$9,375	$2,328	$9,375	$2,328	$9,375	$2,328
ANNUAL NOX DISPOSAL COST	$/YR	$0	$82,500	$0	$165,000	$0	$82,500	$0	$165,000	$0	$82,500	$0	$165,000	$0	$82,500
FURNACE COLD (RAILING CO & SMOKE) IF = 1	NONE	0		0		0		0		0		0		0	
NEW NOX EMISSIONS RATE W/ NEW CONTROL DEVICE INCLUDED IN CAPITAL COST	LB/H	1.25		1.23		1.23		1.23		1.23		1.23		1.23	
BASE CAPITAL COST OF STORAGE SUBSYSTEM	$	$75,410		$84,259		$84,259		$86,781		$86,781		$86,781		$86,781	
BASE CAPITAL COST OF LONG MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0		$0	
BASE CAPITAL COST OF SHORT MECHANICAL CONVEYOR	$	$0		$0		$0		$0		$0		$0		$0	
BASE CAPITAL COST OF RDF DELIVERY SYSTEM	$	$65,906		$76,511		$76,511		$76,511		$76,511		$76,511		$76,511	
BASE INCREMENTAL COST OF ASH HANDLING SYSTEM	$	$0		$0		$0		$0		$0		$0		$0	
BASE INCREMENTAL CAPITAL COSTS FOR EMISSIONS CONTROL	$	$0		$0		$0		$0		$0		$0		$0	
BASE INCREMENTAL COST FOR BOILER MODIFICATIONS	$	$228,760		$228,760		$228,760		$228,760		$228,760		$228,760		$228,760	

out 4 summary

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Summary of Sensitivity Analysis
Sub Base Bangor, Washington

		Conventional Fuel Dsem 25%		Best Case Analysis 1		2		3		4		5		6	
		RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventional Fuel	RDF Cofiring	Conventio Fuel
BASE TOTAL INCREMENTAL CAPITAL COSTS	$	$370,075		$389,530		$389,530		$392,052		$392,052		$392,052		$392,052	
BURDENED TOTAL INCREMENTAL CAPITAL COSTS	$	$488,499		$514,179		$514,179		$517,509		$517,509		$517,509		$517,509	
CAPITAL RECOVERY FACTOR	NONE	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
ANNUALIZED COST OF CAPITAL	$/YR	$0		$0		$0		$0		$0		$0		$0	
TOTAL ANNUAL O&M COST	$/YR	$570,487	$628,745	$798,958	$1,317,221	$798,958	$1,317,221	$714,770	$1,046,897	$714,770	$1,046,897	$689,260	$628,745	$689,260	$628,745
TOTAL ANNUAL COST INCLUDING COST OF CAPITAL	$/YR	$0	$628,745	$0	$1,317,221	$0	$1,317,221	$0	$1,046,897	$0	$1,046,897	$0	$628,745	$0	$628,745
TOTAL COST PER MILLION BTU OF STEAM	$/MM	$0.00	$4.04	$0.00	$6.40	$0.00	$6.40	$0.00	$6.72	$0.00	$6.72	$0.00	$4.04	$0.00	$4.04
SIR (SAVINGS/INVESTMENT) AT EQUAL ANNUAL STEAM PRODUCTION	NONE	-2.21		2.95		2.95		0.86		0.86		-4.28		-4.28	
TOTAL O&M COST PER MILLION BTU OF STEAM	$/MM	$5.04	$4.04	$5.34	$6.40	$5.34	$6.40	$6.31	$6.72	$6.31	$6.72	$6.08	$4.04	$6.08	$4.04
O&M COSTS FOR PULVERIZER IF NOT RDF BUT COAL USED AS RSF	$/YR	$0		$0		$0		$0		$0		$0		$0	
TONS PER YEAR RDF REQUIRED	TPY	5341		9380		9380		7657		7657		7657		7657	
Avoided MSW disposal cost	$/YR	$24,750		$66,000		$24,750		$66,000		$24,750		$66,000		$24,750	
SIR w/disposal credit	NONE	-1.73		4.18		3.41		2.08		1.32		-3.06		-3.82	

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NAVSHIPYD Library, Portsmouth, NH; PWD, Long Beach, CA; PWO, Bremerton, WA; PWO, Charleston, SC; PWO, Mare Island, Vallejo, CA; PWO, Portsmouth, VA; PWO, Philadelphia, PA; PWO, Portsmouth, NH
NAVSTA PWO, Brooklyn, NY; PWO, Mayport, FL; PWO, Treasure Is, San Francisco, CA; PWO, Seattle, WA; PWO, Vallejo, CA
NAVSUPPFAC PWO, Thurmont MD
NAVSURFWPNCEN DET, White Oak Lab, Proj Mgr, Artic ASW, Silver Spring, MD; PWO, Dahlgren, VA
NAVUSEAWARENGSTA PWO, Keyport, WA
NAVWPNCEN PWO (Code 266), China Lake, CA
NAVWPNSTA PWO, Charleston, SC; PWO, Concord, CA; PWO, Seal Beach, CA
NAVWPNSTA PWO, Yorktown, VA
NAVWPNSUPPCEN PWO, Crane, IN
NOAA Library, Rockville, MD
NSC Cheatham Annex, PWO, Williamsburg, VA; PWO, Norfolk, VA
OFFICE SECRETARY OF DEFENSE OASD (MRA&L) Dir of Energy, Washington, DC
PACMISRANFAC PWO, Kauai, HI
PMTC Code 5054-S, Point Mugu, CA
PWC CO, Great Lakes, IL; CO, Pensacola, FL; CO, Norfolk, VA; CO, Oakland, CA; CO, Yokosuka, Japan; Code 100E, Great Lakes, IL; Code 101 (Library), Oakland, CA; Code 110, San Diego, CA; Code 123-C, San Diego, CA; Code 420, Great Lakes, IL; CO, Pearl Harbor, HI; Library (Code 134), Pearl Harbor, HI; Library, Guam, Mariana Islands; Library, Norfolk, VA; Library, Pensacola, FL; Library, Yokosuka JA; Tech Library, Subic Bay, RP
SPCC PWO (Code 08X), Mechanicsburg, PA
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US GEOLOGICAL SURVEY Marine Geology Offc (Piteleki), Reston, VA
USAF REG HOSP SGPM, Fairchild AFB, WA
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ADVANCED TECHNOLOGY Ops Cen Mgr (Moss), Camarillo, CA
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CITY OF AUSTIN Resource Mgmt Dept (G Arnold), Austin, TX

CITY OF LIVERMORE Project Engr (Dawkins), Livermore, CA
COLORADO STATE UNIVERSITY CE Dept (Nelson), Ft Collins, CO
CONNECTICUT Office of Policy & Mgt, Energy, Div, Hartford, CT
DAMES & MOORE LIBRARY Los Angeles, CA
DRURY COLLEGE Physics Dept, Springfield, MO
FLORIDA ATLANTIC UNIVERSITY Ocean Engrg Dept (McAllister), Boca Raton, FL
FOREST INST. FOR OCEAN & MOUNTAIN Library, Carson City, NV
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GEORGIA INSTITUTE OF TECHNOLOGY Arch Col (Benton), Atlanta, GA
HAWAII STATE DEPT OF PLAN. & ECON DEV. Tech Info Ctr, Honolulu, HI
ILLINOIS STATE GEO. SURVEY Library, Urbana, IL
WOODS HOLE OCEANOGRAPHIC INST. Proj Engr, Woods Hole, MA
KEENE STATE COLLEGE Cunninham, Keene, NH
LAWRENCE LIVERMORE LAB L-90 (F.J. Tokarz), Livermore, CA
LEHIGH UNIVERSITY CE Dept, Hydraulics Lab, Bethlehem, PA; Linderman Libr, Ser Cataloguer, Bethlehem, PA
LOUISIANA DIV NATURAL RESOURCES & ENERGY R&D Div, Baton Rouge, LA
MAINE OFFICE OF ENERGY RESOURCES Augusta, ME
MISSOURI ENERGY AGENCY Jefferson City, MO
MIT Engrg Lib, Cambridge, MA; Hydrodynamics Lab (Harleman), Cambridge, MA; Lib, Tech Reports, Cambridge, MA
MONTANA ENERGY OFFICE Anderson, Helena, MT
NATURAL ENERGY LAB Library, Honolulu, HI
NEW MEXICO SOLAR ENERGY INST. Dr. Zwibel Las Cruces NM
NY CITY COMMUNITY COLLEGE Library, Brooklyn, NY
NYS ENERGY OFFICE Library, Albany, NY
PORT SAN DIEGO Proj Engr, Port Fac, San Diego, CA
PURDUE UNIVERSITY Engrg Lib, Lafayette, IN
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SRI INTL Phillips, Chem Engr Lab, Menlo Park, CA
ST. JOSEPHS HOSPITAL Phoenix, AZ
STATE UNIV OF NEW YORK CE Dept, Buffalo, NY; Maritime Col (Longobardi), Bronx, NY
TEXAS A&M UNIVERSITY CE Dept (Ledbetter), College Station, TX
UNIVERSITY OF CALIFORNIA Energy Engr, Davis, CA; Prof E.A. Pearson, Berkeley, CA; CE Dept (Mitchell), Berkeley, CA; Physical Plant (Ross), San Francisco, CA
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UNIVERSITY OF ILLINOIS CE Dept (Hall), Urbana, IL; Library, Urbana, IL; Metz Ref Rm, Urbana, IL
UNIVERSITY OF MASSACHUSETTS ME Dept (Heroneumus), Amherst, MA
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UNIVERSITY OF TEXAS AT AUSTIN CE Dept (Thompson), Austin, TX
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DURLACH, O'NEAL, JENKINS & ASSOC Columbia, SC
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